The Builder.

VOL. XXX.—No. 1511.

Originality.

TO glance at the primitive signification of a word, so far back as it can be traced, gives us sometimes a hint of more than mere philology, a suggestion for apprehending more clearly the precise value of the idea hidden under an expression which has become hackneyed and dulled in its signification by constant use. The secondary meaning which such a word has acquired may be very different from its primitive meaning, yet the relation between the two may read a practical lesson. In architecture, for instance, there is now an almost pathetic cry raised, a kind of *vox clamantis in deserto*, for "originality." The same demand is made in other quarters; in literature notably, and with some very queer results in response thereto; but it is more strongly and perseveringly urged in regard to architecture than to any other art. In many cases the demand seems the result of a wholesale development of negative criticism, on the part of writers who reverse Pope's conclusion, and say "nothing that *is*, is right:" *ergo*, give us something new; we do not mind what, so long as it is new. In this case it is clear that "originality" only means "novelty," and is used in that sense, whether intentionally or not. In common conversation, however, the word is used in almost exactly the same sense as "individuality;" some quality or manner which gives a distinctive character to a man's work, by which we recognise it as his among other productions of the same class. A good many painters, a good many writers, are currently spoken of as "very original," of whom the expression is only true in this sense, and when, in fact, the more correct expression often would be that they are "very mannered;" a phrase which cannot really imply the same thing as "original," since the one expression is always used with a complimentary, the other with an uncomplimentary, meaning. And as to novelty, if we set a column with its base upwards, and standing on its abacus, that would be "novel," no doubt, but would scarcely be praised as "original."

Origo is described in Latin dictionaries as derived from the verb *orior* (to arise), and its primitive meaning given as "that which causes a rising or springing up." And from one point of view this derivation certainly countenances to some extent the ordinary meaning attached to the word, as nearly synonymous with "individuality." That which has its source and "uprising" in the artist's own mind will be characterised by his own individuality, the latter being the apparent result, the former the hidden cause. But it is just this originating in the artist's own mind which it is so difficult to get, and which is so rarely met with. We are so influenced by the ideas of others, so biassed in our judgment by what has been done previously, so dependent on our predecessors for helps and suggestions, that it is only a small chance that is left for most of us to thrust into the composition anything that peculiarly belongs to our own mind and personality. It is only a few of the rarest and most powerful minds who have been able to become really founders of new ideas in art, "full-welling fountain-heads of change." The rest, it should seem, must be content to copy largely, to take most of their ideas second-hand, or to do nothing. "There's the respect that makes calamity" of so much of our architecture, in the eyes of the desponding school of critics. And if it is necessary to originality that each work of art should present a wholly new interest of its own, independently of whatever has gone before it, then is their despondency in this point very well founded indeed, so far as all analogy will enable us to judge. But the demand made by this class of critics upon architecture is an unreasonable one, in degree if not in kind, and such as would not be made upon any other art. We do not demand that each musician should invent new forms of composition, new principles of harmony, before we will allow him originality; we are satisfied if he can give his own colouring, his own treatment, to his ideas, without necessarily ignoring or departing from the laws and practice which governed his predecessors. We do not expect a new poet to invent a new language (and heartily wish some of them would not try!), or a painter a new system of manipulation. Yet these are hardly greater demands, relatively, than are made on the hapless architect by some of his advisers. But even if we waive the question as to the amount of originality of this kind to be demanded, is there not a question also as to whether this is the right way to look at the matter at all? Is it not just as fair and logical (and etymological too) to regard "originality" as signifying, not the effort on the part of each one to raise designs out of his own moral consciousness, but the return in each case to the original principle or motive on which the design of any particular object should be founded? Is not this in fact almost the very essence of originality, in so far as it can be obtained by the majority? We have occasionally minds which seem to be a new era in themselves; but for the most of men what is needed to make their productions worth terming original, is that they should look to the primitive meaning and intention of what they are designing, and treat it *ab initio* in their own manner, and not in somebody else's manner. When working on this principle, almost every man who is educated, and who thinks at all, has his own natural bias, his own idiosyncracy, sufficiently marked to give distinctive character to his work. If, on the contrary, he works on a fixed type, accepted or thrust upon him, he voluntarily casts aside the main means and possibility of being original, and instead of enjoying the opportunity of varying the expression of an idea, he only allows himself scope for varying the form of other person's expressions. This drawback to originality in design is not confined to, or peculiar to, architecture. We see it, for instance, in the works of the earlier sacred painters of Italy, where certain types were accepted and followed for generations, not only for the faces and aspects of particular personages, but even for the treatment and disposition of the whole subject in representing such incidents, for example, as the baptism of Christ. Genuine originality was of course almost as impossible for painters under such circumstances, as it is for architects when they are willing to accept one particular type for a church, or for isolated portions of it, or of any other building.

Now, this consideration indicates, we think, more distinctly than it has hitherto been indicated by architectural critics, the essential difference between originality, properly so called, and mere mannerism, novelty, or eccentricity. The latter is something only on the surface of a work of art, not in the least touching its intellectual value or the basis of its composition. When Sterne, in the later books of "Tristram Shandy," took to the devices of coloured leaves, blank pages, and unfinished paragraphs, this was not that he was more original than at first, but less so: he had worked far away from the original vein of humour from which the book had started, and, having spun it out beyond its limits, had recourse to these shallow devices to keep up the flagging interest of his readers. In like manner, when an architectural designer invents extraordinary and portentous chamfers over his doors, designs arches with scarcely any vertical pier, and with enormously deep voussoirs, and puts buttresses just where no one would expect them, this is not being original, but just the reverse: it is a proof that he has lost sight of the original object and end of building,—that he is using features without thinking of their origin or the principle on which they should be treated, and is only trying for a sort of cheap notoriety, by differing in small details from every one else, without purpose or reason, and deserves no higher praise than that of mere oddity. The worst of this kind of so-called originality is, that there is no rational limit to it, the effort of each one of the eccentric designers being to surpass the others in eccentricity; and as there is no principle to regulate or restrain their devices, such artists are driven to producing effect by a perpetually stronger dose, till their designs become little more than a jumble of unmeaning whimsicalities.

To exemplify: if an architect has a window to design, he may choose to start from the assumption, either deliberately made or acted on through habit, that one particular form of window is the only one worth taking as a type, in the matter of design,—a pointed Gothic window, for instance, with moulded jambs and archivolt. Now, this leaves a very narrow field for the introduction of individual treatment. He can vary the radius of his arch and the profile of his mouldings; and, in order to be "original," he will take, perhaps, to some abnormal proportion of window, all height and no width, or the reverse, or will invent some ineffective variation of the moulding in the jambs in order to say that he did not copy, but was original. But if, instead of taking a Gothic window as his *point de départ*, he take the original idea of a window, which might be stated thus,—an opening for admitting light from without and for prospect from within, capable of variety of proportion in height and width, of being covered at the top in various ways (by an arch, a lintel, or a combination of the two), presenting two special surfaces for decorative treatment (viz., the jamb and soffit at right angles to the window plane, and the filling in of the window plane itself, which may be decorative in an almost infinite number of ways), requiring an effectual and rapid removal of the rain from it at the foot, and in some situations being all the better for a weatherfend against sun or rain over the head,—if the feature, we say, be regarded in this way, there are fifty more chances of getting at an original treatment of it than if some one else's previous treatment were adopted as a fixed type, and we are limited merely to minute variations in detail of that type. And this would be originality in the true meaning of the word, attained by going to the origin of the feature, and taking the designer's own treatment of it from the beginning.

So of any other feature; a door, a tower, a porch: the question for the "original" architect is not, "What new variation can I make in the orthodox method of treating this feature?" but rather "What is the object of this feature, and how can I render it expressive and ornamental,

in keeping with that object?" We do not say that thus it would be possible for every architect to invent his own new treatment of every feature; the majority would necessarily be influenced in their ideas, some more and some less, by what others have done; nor do we say that it is either possible or necessary to do this kind of thinking out, *ab initio*, of everything a man has to design. Life is so short that the busiest amongst us especially are compelled to take many of our thoughts at second-hand. And it is probably quite true also, as several critics have urged, that the man who has studied most of other styles in all their varieties, will be the one likely to have the greatest number of original ideas at his command; for two different treatments of one feature will often suggest a third, again capable of variation, and so on. But we cannot help thinking that if this view of "originality" were more recognised and borne in mind by our architects, there would be more chance of really original designs making their appearance, not only from the fact that the mind of the designer would be applied to the consideration of what really was wanted to make an architectural treatment in a particular case, instead of what it might be the fashion to want, but also because from such a point of view even the copying and adaptation of other designs assumes a new aspect, since it is regulated by a principle which teaches us to adopt what is essential in the treatment, and ignore what is accidental, and thus places some sort of bounds to that reckless variation for variation's sake which has led to so many absurd eccentricities in modern architecture.

There will be one drawback, however, in the eyes of many modern architects, at least, to this view of originality, that in this case "originality" means *thought*. And people are living too fast now to pay anything for thought, and 5 per cent. certainly will not pay for it, in most cases, at least. It is to be feared that we cannot show our readers the way off the horns of the dilemma, except by adopting the simple but unpalatable course of doing work well, and being content to be ill paid for it. Whether the public mind will ever be in a state to recognise that there may be more thought in one building than in another (as they recognise it to some extent in paintings), and to be willing to pay for this thought as "value received," is very problematical; but we take this to be the answer to those who demand more originality in architecture. Coleridge said that "to admire *on principle* is the only way to imitate without loss of originality,"—a dictum which the late Mr. Leslie adopted as a motto for his "Hand-Book for young Painters." Applying the same thought, we should say to the architects, that to design on principle is the only way to insure originality.

OUR GREAT FORTIFICATIONS AT PORTSMOUTH.

THE effect on the architecture of the future of the employment of iron as a main material for building is a subject of extreme interest. It is not the architect alone who is concerned in the matter. While the architecture of a country, or of a period, is a reflection of the manners of the time, it reacts, in its turn, on the habits of the people. As far back as structural relics allow us to judge,—and the period is one not readily estimated in centuries,—the exigences of military defence have greatly defined architectural progress. When to the strength of structure required for safety we add the means of such appeal to the imagination as was suggested by the rites of religion, we sum up the chief motives of architecture.

Six years ago (*Builder*, vol. xxiv., p. 73), as well as at other times, we ventured to offer some considerations on the effect likely to be produced on military, and thus on civic, architecture by the rapid strides that were being made in the improvement of projectiles. The Italian war had yielded novel and valuable experience, in the siege and fall of the once impregnable Gaeta, of the revolution that was in progress. Quietly and steadily, since that time, have our own Royal Engineers been at work, aided by the powerful resources of the Fairbairn Company at Manchester, in the preparation of an impregnable line of defences for our great naval arsenal of Portsmouth. With the commencement of the present year, the most novel part of these defences,—the skeleton framework of one of the largest iron forts,—has advanced to a condition which renders some detail likely to be acceptable.

The idea of impregnable fortifications is as old as any records of mankind,—older, it is possible than the lineal progenitors of any existing human races. What thews and muscles were theirs who reared the enormous megalithic structures of prehistoric date we have no means of judging. But we know that, not farther back than two and a half millenniums, the great brick-building people that dwelt in the fertile valley watered by the Euphrates and the Tigris surrounded their thickly-populated home with enormous mounds of earth, faced with stone and with brick, from the broad summit of which even their women looked with contempt upon the armed forces of the invader.

What were the causes that led to the abandonment of the Assyrian method of fortifying large cities, or rather walled provinces, it is not easy to determine. The fact of the repeated capture of Babylon, and the knowledge of the power possessed by an invader of diverting the course of the great river that watered so large a population, must have told for much. But walls, though less stupendous, were still reared by the founder of cities. So late as the Roman occupation of England, that great engineering people drew lines across the northern boundaries of the island, to exclude the ravages of the Pictish and Scottish tribes. And the sentinels on the Great Wall of China still watch over this costly outwork of the stereotyped civilisation of the flowery land.

With the change in European life that succeeded the settling down of the successive waves of northern barbarians that had overflowed the corrupt and effete Roman Empire, individuals, whether petty rulers, great lords, or even municipal authorities, assumed more prominence than was accorded to any but the supreme heads and fathers of the nation in earlier times. Thus seigneurial castles and keeps arose, and the towers of many a robber chief dotted the landscape, in a manner more conducive to its picturesque charms than to the well-being of the inhabitants at large. We have examples of one kind of castle in the ancient Papal residence at Avignon. In this country we may point to Rochester Castle, as one of somewhat similar structure. The idea, indeed, of these square turreted buildings is illustrated by the Tower of London. But it is to another class of fortalices, such as is represented by the great Round Tower of Windsor, or by the Castle of St. Angelo, on a large scale, or by Conisborough Castle, in Yorkshire, and many an Irish tower on a small one, that our attention is recalled by the newest phase of our military architecture.

The combination of strength, economy of material, and economy of space that is given by a tubular structure is well known, even to those who have not pushed their experimental researches further than the examination of a stalk of wheat. For a defensible residence, a round tower, in the first instance, offers the most appropriate form. We remarked, not very long ago, as to the great number of these structures that rose, especially in Italy, before the introduction of gunpowder. But with that great advance in the science of offence, a new state of things arose. A single tower presented a mark that might be readily and fatally attacked by converging lines of fire. With imperfect artillery, the balance of force was greatly on the side of the attack. Private turrets, as no longer defensible, rapidly disappeared.

With regard to the defence of towers, or of regular fortifications, the erection of the noble circular towers that yet mark some fine old Norman structures was discontinued for two reasons. One was, that it was desirable to have the means of sweeping the assailants from the ditch by a well-directed fire. This the defenders of a round tower, or system of round towers connected by curtains, could not readily effect. The other was, that from every port-hole, or every embrasure, the gun pointed in a radial direction. Concentration of the fire of the defence on the head of the attack was thus impossible. For three excellent military reasons round towers, in spite of their great structural advantage, disappeared altogether from defensive works, even before the time of the organisation of the polygonal system by Vauban.

The latest outcome of engineering science applied to defensive structures has brought us back to round towers. At Sheerness, below Gillingham, and at one or two other commanding points near the junction of the Thames and the Medway, have recently been constructed new river defences of London and of Chatham. Neither the metropolis nor the great school of our army can now be reached by any hostile vessel. These new forts are circular in plan, built in part of granite, but with the portholes of their enormous guns protected by iron shields and framework of a strength suited to resist the utmost force of shot that can by any means be expected to reach them.

It speaks well for the officers and manufacturers who have been so long and so ably at work to protect the vital centres of the country from that surprise to which, a quarter of a century ago, we unquestionably lay open, that so little public attention has been hitherto directed to the progress of these important works. The notice that is now taken of those in course of execution for Portsmouth is due to the fact that the vast iron ribs of a structure that is without a rival in its gigantic strength (looking at the twin towers of 200 feet diameter each, and at the two smaller ones of 150 ft. and 120 ft. diameter, as forming parts of the same system of defence) have just been fitted together on the premises of the manufacturers at Manchester.

Portsmouth, it is asserted, when these works are completed, will not only be safe from any attack by sea, for we are approaching the limit of possible sea-borne batteries and offensive means, but she will be safe even in the unpleasant contingency of an attack by land. Eleven hundred thousand pounds is the sum that we are now spending in what our French neighbours call the blinding,—that is to say, the sheathing in a thick, impenetrable, ponderous shell of iron,—of the four forts that form the most novel and formidable features of these defences.

Of the great twin towers which are hereafter to give meaning to the line,—

"Britannia needs no bulwark, no towers along the steep,"

one is situated on a spot known by the name of No Man's Land, about 2,000 yards to the north of Ryde Sands, and the other upon the Horse Sand Shoal, some 3,500 yards south of Southsea. The main entrance to Portsmouth harbour lies between these two gigantic sentinels, which can bring their fire to bear on the channel at a distance from one another of only 2,000 yards. With these main forts are connected two others of similar construction, but of somewhat smaller proportions, the least of which,—that of St. Helen's, on the west of the Isle of Wight,—is of a diameter of 130 ft.

The two larger towers carry each two tiers of guns, the lower one containing twenty-four 600-pounders, of 12-in. bore, and weighing 25 tons each; the upper, twenty-five 400-pounders, of 10-in. bore, and a weight of 18 tons. The former throw a bolt weighing 600 pounds, which is propelled by the explosion of 85 pounds of powder. The velocity of the shot on leaving the muzzle of the gun is 1,300 ft. in a second. The force of impact is 7,000 foot tons at the muzzle, and 6,000 foot tons at a distance of 800 yards. In what we must comparatively call the smaller guns, the weight of projectile is 400 pounds, that of powder 70 pounds. The force of impact at muzzle is 5,000 foot tons; at 800 yards, 4,400 foot tons; and the velocity on leaving the muzzle 1,360 ft. per second.

We enter into these details for the reason that they are such as to enable us to understand how the military objection to the use of circular towers has been in this instance overcome. To attack an incoming iron-clad vessel, a concentration of fire is, no doubt, necessary. But the concentration which was formerly effected by training the guns of a broadside, as of a bastion, to bear on a single point, is now produced by the more simple, certain, and irresistible means of firing the whole weight of a broadside from a single gun. Could the bolts of the 64-pounders be made to strike at the same moment, in exact proximity, on the side of a vessel, the shock would be very far less than that caused by the delivery of a like weight of metal in one mass; while as to penetrative power, the large bolt possesses it, and the smaller ones do not. They might pepper away very disagreeably at the sides of one of the giants that are now set afloat, without any very imminent destruction. But the large bolt will go straight through 12½ in. of iron at 200 yards, 11½ in. at 1,000 yards, and 10½ in. at 2,000 yards. These measurements of the offensive power of the armament of the forts enable us to form a very satisfactory estimate of their defensive strength.

On foundations supposed to have been pre-

pared with great care, will be raised first a circular mass of masonry rising to the height of 16 ft. above high-water level. On this will stand a closely-jointed iron tower, of the height of 26 ft., and the diameter, as before stated, of 200 ft. The skeleton of the structure is formed of piers of wrought iron filled in with concrete. Vertical ribs of iron form a sort of palisade round these piers, being bound together by three wrought-iron rings, and finally *planked* with great iron slabs, each some 26 ft. long. There are three several concentric thicknesses of these iron plates, each 5 in. thick, the two intermediate spaces, also 5 in. thick, being filled solid with concrete. Under the port-holes, however, the thickness of the iron is increased to 17 in., with 10 in. of concrete. A bomb-proof roof covers the upper gallery, which runs round the inner part of this tower, on a floor of iron beams and concrete, to support the upper tier of guns. We can only hope for the sake of posterity that the effect of concrete on iron is fully understood.

This enormous mass of iron, of which the skeleton alone weighs 2,500 tons, is so delicately and accurately fitted together as to form a homogeneous whole. Every face joint is planed, every hole drilled. If it cannot entirely be said that neither hammer nor axe nor any tool of iron will be lifted up upon it while it is in building; yet, that assertion will in a certain sense hold good: indeed, in the same sense in which it applied to that famous temple fortalice dear to masonic tradition. Not a chip will be struck from the iron. It will all go together like the pieces of a watch, or of a rifle made by machinery. Hence any impact of shot or shell will be resisted, not by the surface struck alone, but by the whole immense weight and metallic elasticity of the entire tower. The enchanted castles of fairy tales are as nothing in face of this giant baby of modern metallurgy.

These noble iron forts will be accompanied by the minor protection of land batteries at Southsea and Gillecker, at the Needles and Hurst Castle.

We may be pardoned for one word as to the strategic importance of a series of works, as to the engineering qualities of which we have spoken. We cannot doubt that it is of the first order. We have to remember that for 800 years the sea has been to England a bulwark and a safeguard. On two occasions only since the Norman Conquest has this island been seriously menaced by a foreign foe. On each of these occasions our assailant was able to dispose of almost all the resources of that part of the Continent from which we could be readily attacked. The winds and the tides, with which even Julius Cæsar shunned a third time to contend, shattered the great Armada on our shores. The flotilla of Napoleon, if, indeed, it was more than a feint, as to which military writers are in doubt, was never able to put to sea. In this, the safeguard of the past, lies all the reality of our protection for the present.

For this reason, without prejudice to the importance of girding London with a chain of detached forts, and of protecting Chatham on its only vulnerable point, the hills on the left bank of the Medway, it is of vital importance to the safety of the country to have impregnable harbours in which our fleet may lie in absolute safety, ready to issue at any moment to sweep from the Channel an invading flotilla. For the Sussex coast, the point struck first by Cæsar, and then, eleven centuries later, by William, Duke of Normandy, Portsmouth is suited to fulfil this condition. With Portsmouth that which she is in course of becoming, no enemy will be able to throw a shell into her harbour. Resting on this perfect base, our fleet may be well able to answer for the inviolabitity of our coast south of the Thames. With regard to the Norfolk coast, a second Portsmouth would be desirable. We conclude that the Thames itself would be the station for the division of the fleet that had to defend this portion of our coasts. Portsmouth is our great defence against France. As to our defence against Germany, it is only about a twelvemonth since we have begun to feel that it is a duty to be provided.

While feeling that, in the present state of military and naval warfare, defensive measures like those which we have described are a wise and sound economy, we see no reason to depart from the opinion which we have before expressed, that the present form of seagoing bottoms is of an essentially temporary character. Two distinct considerations led us to form this estimate; and the course of events during the past eighteen months has not only confirmed its accuracy, but gone far to turn opinion into certitude. One of these is the historic view. The amount of thought, science, and admirable workmanship that was expended, more especially by the armourers of Milan, in forming a perfectly safe, and at the same time very flexible, panoply for the defence of the person of the warrior, and a panoply of altogether different nature for the tournament, cannot be imagined by those who have never examined the actual suits worn by kings and nobles in the fifteenth and sixteenth centuries. A mode of attire that was at once consecrated by the use of generation after generation, and eminently handsome and noble, disappeared altogether in a few years before the improvement of projectile force. If this was the case with personal armour, how much more strong is the probability that a similar course will be followed by armoured ships, in which the mechanical laws of flotation operate as a positive limit to the thickness of the plate,—a limit beyond which one offensive power has already sensibly advanced. Add to this the fact, that it is not the strife between gun and target alone that must be regarded, but the irresistible force of that great guardian of forts and harbours—the *torpedo*. We feel convinced that the form of the war navies of the future must be altogether different from that of the strongest existing vessels, in which, when attacked by such torpedoes as we already make, the immense weight would only serve to ensure instant and total destruction.

Notwithstanding this progress of science, it may be hoped that the outlay on the Portsmouth forts has been wise and satisfactory. Not only were all the details of these structures to a great extent determined before we had gained our present experience of torpedo action, but even were the case now to be decided, we should do well to pay a million or two extra for the mere sake of the moral effect, both on ourselves and our possible opponents. The fall of 1 per cent. in the price of Consols—to say nothing of the much larger amount of railway and other stocks,—would be a loss of six times the cost of rendering our chief arsenal impregnable. It may be urged that such a depreciation is only an imaginary loss,—that it is a debt we owe to ourselves, and a mere removal of money from one pocket to another. But the reply is, that the fall in the price of public securities is an index of the loss of public confidence, the effect of which is the arrest of enterprise of any description. When we know how a marked fall—say of 8 or 10 per cent.—is enough to paralyse trade, commerce, and manufacturing industry, we may easily believe that slighter depreciations of value represent diminutions of our productive action, of at least a magnitude equal to their own. To pay, then, a few millions more or less by way of insurance, in rendering our coast service, our fleet, not only seaworthy, but supreme; and our army that useful organ for which it offers an unsurpassed material, if only it be wisely organised and trained, is not only a penny wise, but a pound wise, economy. Regarded in this light, we congratulate the country on the well-organised defences now in course of completion at Portsmouth: while as a specimen of the art of the builder working in new material, to bid defiance to colossal engines of attack, which two years ago might have been well regarded as irresistible, we feel greatly proud of the iron fortifications that Manchester frames to guard our fleet.

EAST GREENWICH WORKHOUSE.

UNDER the title of "Christmas under the Poor Law," the leading journal gave, some time ago, an article concerning thirty-two of the thirty-three unions in the metropolitan poor-law district. The one union of the thirty-three "conspicuous by its absence" is, singularly enough, that which includes two of the three towns—Deptford and Greenwich—represented in Parliament by the Right Hon. W. E. Gladstone, Prime Minister. The article in question contained statistics of varied character, embracing the number of houses, the number of inhabitants in the various unions at 1861 and 1871, the workhouses at which the inmates had egg-flip in the evening, and snuff and tobacco, and half ounces of butter, in addition to statements of the quantities of beef consumed, and of the ingredients of the plum-puddings prepared. It is too late now to describe the Christmas treat in the Union Workhouse at East Greenwich, but a few particulars of the establishment will not be out of place.

It is not necessary to quote statistics largely to show that the Greenwich Union House is entitled to a place among the others of the metropolitan district. In locality the union is an outsider, but in extent and numbers it is a fair average example, and entitled to mention. It has a total population of 100,601 in the union, and has 851 inmates in the union workhouse. Among the others enumerated by the *Times*, that have larger numbers of either population or poor, are:—the City of London, with a population of 111,784, and 2,390 inmates of the house; Marylebone, with 159,169 in population, and 1,874 inmates of the house; St. Pancras, with 221,594 in population, and 1,610 inmates. On the other hand, showing smaller unions, with lower numbers of populations and inmates of the houses, there are Chelsea, with 71,086 population, and 523 inmates of the house; the Strand, with a population of 42,978, and 916 inmates; St. George's-in-the-East, with 48,235 in population, and 1,051 inmates; and Whitechapel Union, with a population of 78,970, and 836 inmates. We do not know how the elder children are dealt with in the several instances just referred to, but there are in the Greenwich Union Workhouse 66 children; and at the educational and training establishment at Sutton, 357 children chargeable to the Greenwich Union. The inmates of the Greenwich Workhouse, are at present 851, consisting of 320 males, adults, 465 females, and 66 children.

The assemblage of buildings constituting the establishment is Elizabethan in style, of white Suffolk brick, with stone cills and lintels, and was erected about thirty-six years ago. It does not provide a palace, as regards external appearance or internal decorations, but embraces such healthy and cleanly accommodation as is necessary for the shelter and maintenance of the helpless poor. A considerable space is left vacant, as garden-ground and forecourt, between the front buildings and the public road. The entrance is through a block appropriated to the Board-room, and a number of offices. This building is in two stories, and is flanked on each side by two other ground-floor structures, used for miscellaneous purposes. Behind the front block is an extensive quadrangle, one side of which is formed by the main building, and by long wings, which intersect and project upon it, without joining at the ends. The principal building consists of a basement, a ground floor, and two upper stories for dormitories, infirmary-rooms, day-rooms, &c. The entrance to the house is in the centre, close to which is the master's and other offices, and the dining-hall, which is used on Sundays as a chapel. A circular staircase, under a campanile, gives access to the rooms of the master and matron, and to the long corridors upon which the dormitories and infirmary and day rooms open. The number of cubic feet of air per inmate in the dormitories, the day-rooms, and the dining-hall, is in accordance with the ordinances of the Poor-Law Board. The statutory accommodation in the house is for 850 persons, we believe, and it contains at present just one over that number. Having gone over the whole house, however, we feel justified in saying that there is no evidence of crowding.

Mention has been made of the 400 Greenwich Union children that are at Sutton; but there are children chargeable that are too young to be sent thither, and about twenty will be found in the house.

Poor little waifs, three of them have been picked up in the streets! Who can foretell their future? They are all clean, happy, rosy, and bright-looking now, whatever their after lot may be. They are so young as not to have reached the age when dress indicates the sex of the wearer; but the mode of parting the hair and a little head ornament marks the girls.

A visit to a workhouse suggests melancholy reflections. It is humbling to note such a low form of human life,—in many instances it is mere existence, not life,—an unvarying round of eating, maundering, sleeping, dozing through an existence that has ceased to have use, aim, or object. It is curious to notice the effect that the workhouse *régime* has in prolonging the lives of those who may have often survived hard buffetings in the world. Anxiety and care concerning the future are thrown off at the entrance to the house, and the inmates are henceforth placed under conditions more favourable to health and longevity than they have ever before experienced. In the Greenwich workhouse there are 431 inmates that are over sixty years of age, and of these more than fifty have seen more

than fourscore years. Several have reached the verge of a century of life, and one, Thomas Taynton, of Bristol, who has been an inmate for four years, has passed, it is asserted, his 102nd birthday. These old persons of both sexes furnish startling illustrations of Shakspeare's marvellous text descriptive of old age and its infirmities, and of the "labour and sorrow" attaching to life beyond fourscore years. How true the descriptions of the aged as they are seen here! "The moist eye, the dry hand, the yellow cheek, the white beard, the decreasing leg, the increasing belly, the broken voice, the short wind, the double chin, the single wit; every part blasted with antiquity." The poor creatures can only drowsily answer shrieks in their ears by piping a childish treble, and in their pitiable second childishness are "sans teeth, sans eyes, sans taste, sans everything."

We heard good things said of Mr. and Mrs. Kilbey, the master and matron.

LONDON AS IT IS, AND AS IT MIGHT BE.*

IN taking as the title of my paper, "London as it is, and as it might be," I am perfectly aware that I am choosing a colossal subject, and one which I can only hope to treat in a very cursory manner in one short paper.

IN many respects there is no city in the world to be compared to London. Its vast extent and population, and its boundless wealth, form an inexhaustible theme for its panegyrists, and it would be perfectly absurd to compare any city, ancient or modern, with it in commercial importance and activity. Even in natural situation it is to be doubted whether many cities excel London. Whether we look at the central parts, rising by a gentle slope from the bold curve of the river from London to Westminster, or the natural beauty of the suburbs round the heights of Hampstead, Highgate, or Sydenham, or along the banks of the Thames as far as Richmond; and yet, with all these advantages, it cannot be denied that London is not so attractive as it ought to be. If to any one, one would think this place would, at least, be interesting to Americans, who draw their blood and their language from "Old England." But Americans will come here, rattle through the chief sights of the place as a matter of duty in a few days, and then rush off to spend the bulk of their time and money in Paris; and no wonder, for, compared with the gay and cheerful French capital, our London looks a dirty hole indeed. No one who wishes to pass a pleasant existence, with those advantages which are only to be obtained in a metropolitan city, would hesitate to choose Paris in preference to London, unless, indeed, the chance of being knocked on the head was thrown into the scale; then, perhaps, he might decide in favour of the latter.

It will not be out of place, then, I think, in an assemblage like this, which represents the architects of the future, to consider why this our city (which we justly and proudly consider the queen of the cities of the earth) compares so unfavourably with some others in external appearance; and if in the paper itself, or in the discussion which follows, we are able to ferret out any of its defects, and suggest any remedy for them, the object of bringing the subject forward will be answered.

I will divide what I have to say under four heads, as follows:—

First. London is abominably dirty, and there is no reason why it should be so dirty.

Secondly. It is much more smoky than it ought to be.

Thirdly. The general aspect of its streets,—even the principal ones,—is commonplace, uninteresting, and even ugly; and, compared with the advantages gained, a very trifling expense would make an astonishing difference in this respect.

And Fourthly. There is a want of uniformity of plan,—general supervision, from a fine-art point of view.

Now, as to the first head, by saying that London is dirty, I mean that it is dirty far beyond what it needs be. A certain amount of dirt we must always expect in every large assemblage of houses and human beings; but in London everything is dirty. How many of its buildings are so blackened by smoke, with their mouldings and cornices so choked up with the dirt of years, and in some cases of centuries, that the effect intended by the architect is quite lost? How soon do its monstrous rows of brick-built houses assume one even tint of dirt? Even the trees seem only to assume their natural colour after a good shower of rain. The air is so full of dirt that everything is covered in an incredibly short time with a thick coating of dust; and as to the streets, an hour or two's rain is sufficient to convert them into a liquid sea of filthy mud. Now, the question is,—Is all this dirt absolutely necessary? Is there any reason, in the nature of things, why the dirt and smoke should have been allowed to accumulate on St. Paul's, for instance, apparently ever since it was built, without being once removed? Would it be sacrilege to give a good cleaning to the beautiful spires and spirets in the City, the details of which are quite hidden by dirt? And why is the Mansion House the only building which is allowed an annual washing? This simple cleaning alone would quite alter the aspect of many views in London.

Then, look at the streets. A very few hours of rain are sufficient to make the evil appear. They are soon covered with a thick dirty mud. If the rain keeps on, this becomes more liquid, and is worked up by the cabs and vehicles into a regular slough. As these rush through the streets, they scatter the mud right and left over the unfortunate foot-passengers. These last transfer the mud from the road to the footpaths, and from thence into the houses, until the dirt and filth of London in wet weather has become proverbial. As an example of the mischief arising from this cause, I may mention that a few weeks ago I attended the service at St. Paul's on Sunday afternoon. It was one of those miserably wet days. The statues had just been thoroughly cleaned, I believe, for the first time since they were put up; and the crowds were being admitted by the west door; but, with that wisdom so characteristic of ecclesiastical authorities, no mats or scrapers were provided for those who entered to clean their feet, and the dirt from the streets outside was being rapidly transferred to the marble floor, there to dry, and to be afterwards ground up, and transferred, in due course, in the form of dust, to the lately-cleaned statues and other parts of the building.

But if the public buildings and the chief streets are dirty, what shall we say when we come to the back slums? What about the neighbourhood of Shoreditch and the New Cut? Those who have been employed on surveys or valuations in the back slums of London, may have seen those filthy little cottages, where each room is the dwelling-place of a family. At the window, on a board, sits the bread-winner,—perhaps a tailor or a shoemaker; the window has not been opened for years, or is nailed down, the panes broken and stopped up with wood, paper, or dirty cloths,—a miserable, squalid bed in the corner forms the nightly resting-place of father, mother, and sickly children, whose wizen features and rickety limbs are pitiable to behold; whichever way you look,—floor, walls, or ceiling,—dirt, filth, you find on every side, and you rush out from the foul air with a feeling of intense relief;—those who have seen sights like these alone have some idea of the real dirt of London; but I leave these back slums for very despair at present, and will only speak of the chief streets and buildings. If the salt has no savour it will be in vain to try and season the whole lump; and I say that it is absolutely impossible to materially improve the aspect and cheerfulness of London, or make it vie in appearance with a city like Paris, till some thorough and frequent system of cleansing is adopted both of streets and buildings. The first and urgent want of London is cleanliness; and cleanliness we shall never have till public attention is thoroughly awakened to the evil, and the present condition of things is considered insupportable. Then, perhaps, a commission might be appointed to see why London is the dirtiest capital in the world, and some measures might be adopted for its continual cleansing. At present the dirt seems to be regarded as an evil which cannot be cured, and must be therefore endured. Some of the measures which might obviously be adopted are as follow:—Materials ought to be employed for the streets which experience has proved to be the most cleanly, such as the asphalte and wood paving; and the streets and footpaths should be thoroughly cleansed as often as found necessary, the present staff for this purpose being at least doubled or trebled. More materials should be employed in the façades of streets which can be most easily cleaned, and every building of any importance should be thoroughly cleaned at least once a year. What is the use of spending thousands of pounds in elaborate carving and ornament, and then permitting it to become merely the lodging-place of soot and dirt?

As a cleanly covering for buildings in a large town, I hold that the much-abused stucco, which can be painted as often as wished, holds a very high place; and Regent-street and the buildings round Regent's Park are certainly the most cheerful and clean-looking in London. But I do not wish for this reason to suggest building London façades in future with stucco fronts as the perfection of street architecture. Indeed, what I have to speak about under the head I am now treating of is not so much the erection of new façades as the keeping clean of those already built, and in this respect stucco has great advantages; and I believe I shall carry the Association with me when I say that if those who had the charge of the streets and footpaths kept them as clean as they might be kept, and those who had the charge of public buildings did the same, and that if each private owner of a house in a street-front were compelled to give his house a thorough and frequent cleaning, whether it were stone, brick, or plaster, a great step would be obtained towards altering the character and cheerfulness of London; and if the saving of things now constantly spoilt by dirt were taken into account, the measures adopted, even though expensive at first, would probably be found economical in the long run.

With regard to the second head,—that London is much more smoky than it ought to be,—I think there is no one in the audience will disagree with me on this, though the remedy may be more difficult to suggest than in the last case. On coming up by train from the country on a bright spring morning, with blue sky overhead, we notice a haze hanging over the horizon towards London as we approach the great metropolis, and, finally, the clear blue sky and pure air may be said to entirely disappear when we are whirled into the heart of the town. A really clear blue sky is never seen in London; there is always to be noticed a haze and dimness about it quite different from country air. Some one will say, perhaps, that this is a necessary evil, and one of the natural results of life in a large city; but anybody who has been accustomed to walk about Paris must have noticed that the air there seems quite as pure as country air, and everything in the best quarters looks fresh and clean from the sky down to the houses in the streets, except perhaps now where damaged by the shells of the Germans, or the fanatical hands of the Communists. It is almost impossible for us to tell how many ills we Londoners owe to this Hydra smoke, belched forth incessantly from hundreds of thousands of fires. It fills the air with soot, carbonic-acid gas, and other unhealthy products. It forms a large proportion of the dust which flies about ruining everything. It injures our lungs, and injures our eyes; it eats its way into our pictures and colour decorations, and entirely prevents the possibility of any general view of London being obtained. From the top of the Monument, or St. Paul's, on a calm day, the glorious prospect of industry and wealth rattling through the streets below, or carried on the bosom of old Father Thames, or attested by those forests of masts in the docks, is bounded in a mile or two by the sulphurous cloud which enshrouds everything in its arms. On a very windy day you can see farther; and when the wind shifts rapidly from point to point, it is curious to notice the smoky giant rolling first on to one and then on to another quarter of the City, the spires and prominent buildings of which alternately appear and disappear from view.

The smoke generally appears to cling pertinaciously to the town itself, so that the heights round, such as Highgate, Hampstead, and the Crystal Palace, are often visible, whereas the intermediate parts cannot be seen. What general views of London would be without smoke can be sometimes seen on a Sunday bright summer's morning, when scarcely any fires are lighted. I have sometimes been quite astonished at the beautiful views which have appeared from Richmond and the high part of Epping Forest; at such times giving general and beautiful views of the City which it would be impossible to tell existed at ordinary times. I was once told by a friend who had chambers in Pall-mall, and whose bedroom was a top room at the back of the house, that if he woke up on a summer's morning at three or four o'clock

* By Mr. A. Payne: read at a meeting of the Architectural Association, January 12th.

and looked out of the window, he had a clear and distinct view of a great part of the town; on looking out again, however, at six or seven, this had totally disappeared, and he was merely greeted by the smoke from the chimneys of the lower houses. It is this smoke, too, which forms a great part of the dust and black specks complained of under my last head, spreading a fine coat of dust and gloomy colour over everything they touch; and that it is prejudicial to the inhabitants is proved by the fact that those who have been bred in town two or three generations back lose vigour and stamina, as compared with those in equal circumstances in the country. But we have not done with the evils of smoke yet. Who does not know what a plague and nuisance a smoky chimney is. I have known more than one London architect's office where the draughtsmen have been obliged to sit in their great coats and gloves, in the middle of December or January, or else endure the alternative of being gradually smoked. Then comes the smoke doctor, that nightmare of the architect, with his horrible twisted chimneys, zinc cowls, and other abortions, all warranted to cure, and "very handsome," according to the patentee's notions. These horrible things form an eye-sore in every street, and damage almost every architectural view in London. Let any one go on to Waterloo Bridge, and look at the noble and stately front of Somerset House, crowned with long rows of chimney-pots of such motley description that one might fancy that all the smoke doctors in London had had a turn at the building.

"Ah!" says the Gothic architect, "that is the fault of your Classic style, quite unsuitable to this cold climate, and to which chimneys cannot be adapted. In Gothic architecture, chimneys are a positive improvement." Are they, my Gothic friend, lover of realities and hater of shams? Come with me a little further down the river, and look at the Temple library. Yes, those are very pretty chimneys, those at the sides, but they are never used, because they were found to smoke. I think you will hesitate to say that those ugly zinc pipes that climb up the roof (forming some of the most untidy chimneys in London) are a positive improvement.

I think it must be conceded, whichever way we look at it, that this smoke is a nuisance which ought to be abated; in fact, next to dirt, the crying evil we have to call out against in London is smoke: and, as in the former case, we shall never be rid of it till the public is persuaded that London is more smoky than it ought to be, and gives battle to the Hydra with that dogged determination to conquer which the British public generally does show when fully alive to an evil. Even then it would take months of discussion, and the brains of our scientific men would be severely taxed before we should have an answer to the question,—How can we have heat and warmth without smoke, or with much less smoke than we have at present?

I believe this question has never been thoroughly and satisfactorily solved, though much has been written on the subject.

One of the chief methods which have been proposed to reduce the evils of smoke is improved grates and stoves, by which the amount of air supplied to the fire is regulated, and wasteful combustion prevented; and there is no doubt that a great deal might be accomplished in this way, and that it is a very important part of our duties as architects to study this subject, and see that our clients are provided with economical grates; for half the smoke and soot flying about in the air is nothing but wasted fuel and heating power lost. Closed stoves, no doubt, give less smoke than open grates; but it is to be doubted if Englishmen will ever give up their cheerful fireside for an ugly black stove. The same objection applies with equal force to heating by steam or hot water; and although an open fire often bakes you on one side whilst you are almost frozen on the other, still a bright blazing fire is a nice thing on a cold winter's night, when the snow and hail are beating outside, and not lightly to be given up.

In New York anthracite coal, or coal without bitumen, is used to prevent smoke with great success; and it seems strange that in this country coal should be prohibited on railway engines, where very little damage would be done by it, and be allowed in large towns where its effects are so diastrous. In Paris, at no very distant period, wood was burnt for fuel; and I remember an anecdote which shows how deeply-rooted was the antipathy of the fair Parisians against coal. One of our English ambassadors, newly appointed to Paris, determined to set a good example to the inhabitants by burning coals instead of such an obsolete fuel as wood. Shortly after his appointment, he held a grand assembly, but was mortified to find that hardly any of the fair sex attended; they had heard that his excellency burnt coals, and fearing that their complexions might be spoiled, they stopped away. Whether complexions so susceptible were natural or artificial it is not necessary for our purpose to inquire: the moral is the same. No doubt, one of the most feasible plans for reducing the smoke-nuisance, would be to make regulations as to the sort of fuel used, and by advocating the use of coke and iron-bituminous coal wherever possible.

I hope I shall not be thought Quixotic in mentioning another scheme which has been hinted at in engineering circles. Those members of this Association who have been into the iron and coal districts, may have noticed some of the iron furnaces belching forth large quantities of flame and smoke, whilst others, which they are told are hard at work, they would imagine to be out, by their giving forth so little. Now, what is the reason of this difference? Simply that the owners of the latter class of furnaces have found out that by throwing away so much flame and smoke, they are wasting a great deal of heating power, and they collect the smoke and gases at the top of the furnace, and bring them back again for heating their boilers and other purposes. Is it not therefore possible, that if all the unconsumed matter which flies off in smoke in a vast city like London, were in some way collected and made use of, a very great saving would be effected, and the nuisance of smoke almost entirely obviated? The scheme, as I have heard it shadowed forth, is something of this sort. Every block of houses would be provided with one or more smoke towers, into which the flues would be taken by descending or ascending flues as most convenient, with openings at intervals for sweeping. In the smoke tower, the smoke would be either burnt or utilised.

The advantages which could be afforded by this plan, if it could be brought from the level of mere suggestion to a practical scheme, are obvious, and there seems no reason why it should not answer as well for a block of small buildings as for one large one, or a factory, where it has often been carried out. In addition to carrying away and neutralising the smoke now thrown into the air, it would be a fatal blow to smoky chimneys, and the smoke-doctor and all his tin chimney-pots would be annihilated, for smoky chimneys are almost always caused by a down-draught on a chimney from some roof or higher point. The smoke-towers would be a fine opportunity for varied architectural design, and such blunders as the chimneys of Somerset House and the Temple Library would be unnecessary in the future. And with such powerful extraction shafts as the towers would be, we should have much greater chance of thorough ventilation for our houses, public buildings, and sewers, than we have at present.

I think I have now mentioned all the different proposals that have come under my notice for abating the smoke nuisance; perhaps some of the members present will be able to suggest others. At all events, I hope they will agree with me that something ought to be done. It is a scandal that the inhabitants of New York and Paris should keep their cities, comparatively speaking, free from smoke; and we, who consider ourselves in advance, or, at least, abreast of our neighbours, should permit the atmosphere of our city to be so polluted as it is at present. London never can and never will be a really pleasant place to live in till it is far less smoky than it is at present.

But I must now pass on to my third head.*

THE DEMOLITION OF THOROLD-SQUARE, BETHNAL-GREEN.

THE houses forming this square, to which we have repeatedly drawn attention in the pages of the *Builder* during the last quarter of a century, are condemned at last, and are now in course of demolition. If ever a parish swamp and fever-nest existed in this metropolis that knew no intermission in the sad havoc it made of human life and human morals, that hot-bed in the heart of Bethnal-green was one. Yet for years the local authorities allowed it to exist, though its public shame was monstrous, and the dwellers within that ill-fated square were living and breathing in daily contact with the infectious dead. Its state twenty years ago, ten years ago, and last year, was nearly similar, but its latest phase was worse in one particular,—that the houses in the interval had grown older, and become absolutely uninhabitable. Here is the picture of the sanitary condition of this place of ill omen given in the *Builder* nearly a dozen years since:—

"At one inquest it was stated that, in twenty-two houses forming Thorold-square, twenty children had been attacked with illness, and that twelve of these had died. The Roger family occupied one room, and were ten in number,—eight children and the father and mother. Here, even without any other cause, overcrowding was sufficient to produce pestilence; but George Stratford, a weaver, tells us that there had been no water supplied to any of the houses but three for eighteen months, except through a broken and unusable pump. In the heat of summer they never had a pailful of water at any time for three weeks except what they begged from others as best they could. The closets had no pans and were not trapped;—in fact, they might be called cesspools;—sometimes they were empty, but he had seen them running over with soil. There were sixty families in the square, and about 350 children among them."

From 1860 to 1871, Thorold-square mended but little indeed in its water supply or closet accommodation, if we were to judge by a personal visit we made on two occasions last year. It was then simply disgusting to view the court-yard around, an open sesame into which the side channels of one side of Bethnal-green drained down a pretty steep gradient, carrying unmentionable filth and sewage to the very doors of those wretched tenements. The closets or perches, or by what other name they could be rightly termed, were indescribable;—the ash-pit or bin overflowing, and the middle of the square, or rather its whole length, one spread out dung-hill. Sickness was still rife in the wretched abodes; the children were ragged, barefooted, bareheaded, and hungry, and not a few of them had the shrivelled and hardened features of old age. The aged were ghastly pale and broken down, and possibly broken-hearted; for how could they be otherwise, condemned in a manner to live as they were?

Is it not a mercy that such a slaughter-yard is abolished at last, though we hope at the same time that the evicted have found a housing of an improved kind near at hand to the centre of their employment. The houses that backed against the square on a line with Turin-street, and which, of course, formed a portion of this square, are being demolished also as we write.

Let it not be imagined that in the destruction of this villainous house property Bethnal-green gets rid of her worst evils. There are various other streets, lanes, and courts quite as bad, as we have long since instanced. Such as Nichols-street Old and New, and Half Nichols-street, Phœnix-street, and several other narrow and crooked defiles extending from the back of Shoreditch Church to a considerable distance eastward—right and left of Bethnal-green-road. In the demolition of Thorold-square a tablet with its name bearing date 1792 will disappear. The houses looked much older than that date would indicate.

SNOW-MELTING.

THE first fall of snow this season in the metropolis must have awakened in the minds of many inhabitants vivid memories of the almost total stoppage of traffic which occurred two years ago, when the heavy fall so rapidly accumulated in the leading thoroughfares in such a manner as to extinguish all locomotion except of the slowest and most expensive description, and defied all the efforts of the contractors' brooms and shovels in carrying it away. *Then* the removal of snow was the general topic of conversation, and induced the Commissioners of Sewers of the City of London to advertise a competition for snow-melting machines. Among those who tendered designs was Mr. J. F. Clarke, of Moorgate (and to whom the 1st premium was awarded), who perfected an invention which he has patented, and which he considers fully able to grapple with and overcome any difficulty that may ever arise through such accumulations. Mr. Clarke does not propose to carry the snow to some far-off point, but, by a great concentration of heat at frequent places, anticipate the work of the wished-for sun. His patent consists in the employment of a series of metal slabs or plates heated by gas and air jets, and placed at an inclination of 2° to 1 ft. in a chamber or vault beside or over a sewer or drain. Upon

* In our next.

these heated plates the snow is thrown, and so melted, and the resulting water discharged into a sewer. The apparatus was put in operation last year, under the supervision of the City engineer. The entrance to the vault can be easily made as a vertical shaft in any of the "side openings" usual to sewers. This vertical shaft is the shoot down which the snow is sent to the heated plates prepared to receive it. The advantage of the apparatus being placed in close proximity to the sewer is apparent, as an easy junction with the gas mains can be effected, and the apparatus itself offers no obstruction to the traffic. But to meet the exigencies of small towns, or any unforeseen circumstances in large cities, the apparatus is constructed so that it may be easily placed in a portable casing, and placed over any gully or other entrance to a sewer, and there perform its work. The cost in the City was ascertained to be from 5d. to 6d. per yard for destroying the snow without any extra street labour. If the same quantity had to be carted away, it is calculated the cost would be from 3s. 6d. to 4s. per yard, even supposing the horses able to travel.

The second prize for a scheme for snow-melting has been awarded by the Commissioners to Mr. J. S. Farrar, who proposed that the snow should be swept up to the centre of wide streets and the sides of small ones; then to be carted away, and thrown into the Thames, vacant spaces, the main sewers, and into heated troughs. Similar propositions were made in our columns long ago.

Mr. William Haywood made a report in 1871 on some experiments in melting snow, wherein he speaks somewhat favourably of Mr. Clarke's scheme. Mr. Haywood remarks, suggestively, in that report—"The recent snow-storm is the first to cause public inconvenience since 1867."

ORNAMENTAL GLAZING QUARRIES.

AT a recent meeting of the Yorkshire Architectural Society, the Rev. G. Rowe read an interesting paper on this subject. He observed that a very moderate acquaintance with the works of Mediæval artists was sufficient to excite our admiration at their singular fecundity of design; and the present subject afforded one of the many branches of ancient art by which the richness and variety of thought might be illustrated. In the general revival of the study of old stained glass, attention was attracted by that more manageable part of the subject which is understood by the term "ornamental quarries." After explaining the meaning of the word "quarry," he observed that the form of the quarry was a diamond, or sometimes a square put diamondwise. It was also necessary that ornamental quarries should each contain within itself a separate pattern or device, since, as it often happens when the design occupied many adjacent quarries, the kind of glass is distinguished by the name of "Running Pattern" or "Grisaille Glass," much of which still exists in this country, and is very beautiful. The size of the pieces of glass which are called quarries has made them liable to vicissitudes peculiarly their own, and their number diminishes yearly. The common accidents of centuries, and the fragility of their material have been the chief causes of destruction; while, in more recent times, on the one hand their apparent insignificance has led to their being replaced by new glass; and, on the other, their easy portability has too often been practically put to the proof by over-zealous but not over-conscientious collectors of ancient fragments. But, notwithstanding, ornamental quarries are, even yet, sometimes found by the score. In such cases they may have formerly filled the windows of the church where they occur. These, however, are the chief dishes of the feast. More commonly only a few miscellaneous examples have been preserved. In some praiseworthy instances these have been carefully set aside upon the restoration of the building, and afterwards grouped together in one window, in a situation where the quarries could be easily inspected. It is also probable that in some cases we possess the only representative of the type that ever existed. The initial letters of the name of either donor or painter, or some canting allusion to it, seems to have been placed in a single quarry, perhaps at the bottom of the window, and to have survived all mishaps. These are extremely difficult to attribute to their rightful possessors unless some chance directs conjecture to the truth. Among other specimens Mr. Rowe referred to one in St. Martin-cum-Gregory's church, with the letters C. R. upon it; and a square quarry containing a trefoil on which are the letters J. E. W., in Holy Trinity, Goodramgate, both of which wait for some one to unravel the mystery. He observed that there are but slender means whereby to judge of the age of quarries. Coarse rough glass of deep green colour is usually an indication of early date. As times went on they used better materials, or more probably melted them more thoroughly together, which caused smoother and cleaner glass to be manufactured. Its uneven thickness remains in old glass throughout, and at the same time forms its chief distinction from the modern materials, and also causes it to be more sparkling and gem-like. He observed that quarries are rarely found *in situ*. The ease with which a small independent piece of glass could be moved from one window to another manifestly conduced to this scarcity of examples in their original place in York. A handsome ciborium occurs at the Minster and in St. Dennis's. In the latter church is an Early Decorated window, having quarries for the background, which is surrounded by a border having a double rose, whose inner petals are yellow and the outer white. At St. Michael-le-Belfrey's is a curious grotesque representing a monk, armed with a sword and buckler, attacking a fabulous monster. Similar subjects often occur in the other work about the middle of the fourteenth century. In St. Martin-cum-Gregory's, York, is an interesting example of a quarry found in its original situation. The windows on the north side had been given by one person, probably a city merchant, whose mark appears in the border, accompanied with the letter R. There is also an R in a quarry in St. John's, Micklegate, of the same date and workmanship. Mr. Rowe next explained the method of arranging the quarries, which admits of a three-fold classification. The most frequent plan is to fill the whole inner space with quarries only, generally of one pattern, but sometimes with two, or even with an indefinite number of designs. Two of the south-aisle windows in St. Mary's, Castlegate, had, previous to the late restoration, the glass in the tracery untouched. It was composed of quarries of more than one pattern, with a plain white border; and in the centre of the lights were circles. These circular pieces contained crowned monograms of the sacred name of Jesus and of the name of the Blessed Virgin. In some instances the quarries are separated by a narrow band of richer work, producing an excellent effect. He gave several illustrations of this mode of arrangement, which always looks well. The third mode of dealing with them is where a considerable portion of the window is occupied by some picture subject, and the quarries are only used to fill up the empty spaces within the border. This practice especially indicates Perpendicular work; less often Decorated; and rarely if ever Early English. Instances of quarries being used as a background occur in St. John's, Micklegate, where a spiral pattern of four hawthorn leaves forms a ground to a picture containing figures of John Randman and Johanna, his wife. Another example has quarries set square-wise, bearing alternately a lion and an eagle. A latter instance is one which is coarsely drawn with eight small trefoils or points round a circle, and composes the field of a kneeling figure of Sir Richard York, who founded a chauntry here, and died in 1498, being buried beneath the window. Other specimens are found in St. Dennis's, where the groundwork of a good Decorated picture window is formed of quarries bearing a cinquefoil. Mr. Rowe next observed that the form and size of ornamental quarries are liable to much variation. In York Minster there are some of gigantic size and corresponding poor effect, this being partly due to their devices, which are large and rambling, being indistinctly painted. The typical quarry presents a compact star-like design in the centre of a diamond, like that at St. Peter's, Norwich. A star of ten wavy points, at St. Martin's, York, is another good example. Some early quarries have a leaf springing from the bottom of the diamond. Graceful patterns are arranged by putting together four fleurs-de-lis; others are formed of four leaves, more or less natural. There are some examples of the first sort at St. Martin's, and of the second kind in St. Helen's and St. Michael's, Spurriergate. When the glass is of the full size and wants the border, it is a safe sign of the Perpendicular date. In the Renaissance period the border was again revived, but the imitation is easily detected, for the bounding lines are not continued to the edges of the glass at the topmost angle. In Holy Trinity, Goodramgate, is a running pattern, where the golden border is rendered opaque by mineral colour and a row of dots scratched out of it. The effect is very good. Indications of dates are also to be derived from the changes which may be noted in the character of the workmanship. Much of the bold effect of early work is due to the custom of covering all the ground of the quarry with hatched lines crossing each other. In Early English work and in the rare specimens which we possess of the Norman period, these lines are painted with hair-like delicacy. In the Perpendicular lines, on the contrary, they sometimes employed these hatched lines to deepen the shades of the design itself, thus forgetting they were ornamenting a flat surface, and the lines, although occasionally fine and flowing, are usually broad and coarse. A late Perpendicular border at St. Michael's, Spurriergate, is composed of scrolls, wound round a stick, which bears the letters "n. m. n. m.," simulating an inscription. The colouring of quarry patterns is almost entirely limited to the use of the golden stain, which was introduced about the year 1310. The brown outline is painted on the inside in a medium which dries sufficiently firm to allow of the glass being turned over for the reception of the yellow stain at the back. The whole is then subjected to the fire at once. Cases where the whole pattern is stained yellow are met with in All Saints', North-street. In one example from St. Dennis's Church, what is probably a quarry has the design left white upon a yellow ground, which is distinguished from the border by a slight smear shade. After noticing at considerable length other peculiarities in the workmanship and the design, he next considered the question of classification. He observed the numerous examples which bear a quatrefoil in the centre, and the multitudinous varieties of the cross, which was developed, so to speak, from a form of four small circles surrounding a fifth. There are also many conventional designs, of which it was extremely difficult to make anything at all. About the middle of the fourteenth century the more natural drawing of plants and animals commenced. Of the latter, the most common is the heart, one of the supporters of Edward IV., of which an example is preserved in All Saints', North-street. In York Minster is a dog, which is, perhaps, part of the arms of the Stapletons, of Wighill. At St. John's, Micklegate, and St. Dennis, are examples of what, at first sight, appear to be hornets, which is a Scripture emblem, but they are probably butterflies. Mr. Rowe next passed to the numerous representations of birds, which were especial favourites with the later quarry painters. As might have been expected, quarries were a convenient vehicle for the representation of heraldic devices, including, under that term, initial letters, monograms, and mottoes. In conclusion, Mr. Rowe added a few words on the subject of modern quarries. The general revival of picture windows and the creditable specimens of this kind which are now produced by our artists have greatly tended to check the use of quarries. Besides the introduction of the latter, made of cast-glass, and very cheap, has brought disparagement upon this method of ornamenting our windows, but nevertheless they may sometimes be used with advantage,—for instance, in situations where light cannot be sacrificed. Moreover, quarry-windows admit of much enrichment. For small windows quarries alone, judiciously chosen, and bordered with rich colour, compose an excellent arrangement, at a comparatively slight cost. In every case the patterns should be hand-wrought, and he added some advice as to the patterns.

SCIENCE IN BIRMINGHAM.

BIRMINGHAM AND MIDLAND INSTITUTE.

THE annual meeting of the members of the Birmingham and Midland Institute was held on the 8th inst. in the Lecture Theatre. Mr. W. C. Aitken presided, and made a valuable address, dealing chiefly with the growth and progress of the Institution, the necessity for science teaching, and Whitworth's munificence. Speaking of the latter, Mr. Aitken said,—

The Whitworth Scholarship suggests to me a more powerful argument in favour of scientific instruction than a whole wilderness of treatises written by *savans* on the subject. Before us

rises the grand fact, that one who in early life was only a working engineer, who by his own unaided industry and perseverance conquered his early difficulties and realised a princely fortune; grander still to think that of that fortune he gave freely, to aid and to help those who, like himself, "feel it hard to climb," to facilitate the acquirement of that which he felt the want of himself in his youth, and his after-life confirmed him in, viz., the want of science in connexion with clever manipulative skill on the part of English workmen. In this he was still further confirmed by a visit made by him to America in 1853. He there saw that the superior intelligence of American workmen enabled them to use machinery of a high order, to compete with which the scientific education of our artizans is absolutely necessary. Hence Sir Joseph Whitworth's munificent gift. He maintains the connexion between science and manual skill. There is no more wisely-guarded gift than his. In the students' competition, the student must, to a certain extent, be able to use tools. In the mechanics' competition the candidate must be an expert. In both competitions a certain amount of scientific knowledge must have been gained, for Sir Joseph Whitworth well knows from practical experience that these are the elements which united make the complete engineer, the able superintendent of a manufactory, and the perfect workman. Forty years ago Justus Liebig proclaimed to the world that the nation most quickly promoting the intellectual development of its artizans, must, by an inevitable law of nature, advance, whilst the country neglecting their industrial training must inevitably recede. This warning voice we heeded not. With abundant supplies of raw material, of mineral wealth to supply cheaply our great national industries, with workmen the best by far as regards muscle and clever manipulation, reckless and spendthrift-like we revelled therein, forgetting that cheap raw material can only for a time, in connexion with clever manipulation, preserve a monopoly, but only till a competing nation, by the education of its workmen, overcomes the difference in the price of raw material. This is distinctly proved by the competition we have been and are subjected to as regards manufactures, according to the Birmingham Chamber of Commerce; seventy-two branches of local industry are interfered with by the competition arising out of articles produced in foreign countries, where primary education, with a higher education embracing science teaching, is given to its artizans.

THE TRADES CONGRESS.

THE proceedings of the Congress held in Nottingham have been very fully reported, and will afford subject for comment hereafter. Amongst the matters discussed of especial interest to the working classes was a resolution of Mr. Hicklin in favour of a reduction of the hours of labour throughout the country in every trade, "as it would be beneficial to the nation at large, and thereby proper advantage would be taken of the facilities for promoting the course of education, reducing taxation, and giving work to the unemployed." This, after some discussion, was carried by a large majority.

Amongst other resolutions passed were these: "That in the opinion of this Congress trades' halls and clubs are highly essential to the interests of labour, as they tend to bring working men together in a manner better calculated to further their objects than other places now resorted to admit of; this Congress therefore cordially advises every trade society to take the subject into immediate consideration."

"That this Congress views with serious apprehension the unfair competition caused by the introduction of convict labour being crowded into the public market, and that the disposal of such labour should be confined entirely to charitable institutions which exist in this country." The mover suggested that subsidised labour of this kind should be supplied to deaf and dumb asylums, hospitals, the army, navy, and the police. This, he thought, would be better for all parties.

Courts of arbitration and the question of labour representation in Parliament were also debated, a resolution approving of the direct representation of working men being passed. In the evening Messrs. Seely, Herbert, Mundella, and Morley gave a *soirée* to the delegates, in the Assembly-rooms.

On a previous evening a crowded working men's meeting was held, under the presidency of Mr. Mundella, M.P. The Hon. A. Herbert, M.P., was also present. Mr. George Potter moved and Mr. Leigh seconded, "That in the opinion of this meeting trade-unions afford the best means of securing to the industrial population a just and reasonable share in the results of their labour as well as the rectification of the grievances under which they have long suffered." The resolution was carried, and a petition to Parliament determined on.

At the close of the Congress a meeting of the general committee was held at the Mechanics' Hall, Nottingham, to consider their mode of action for the coming session of Parliament, when Mr. Alexander Macdonald, of Holytown, Scotland, president of the Miners' National Association, was unanimously appointed president of the Congress Committee for the ensuing year. Mr. G. Howell, of London, was elected corresponding secretary for the Parliamentary Committee; and Mr. William Hicking, Nottingham, was appointed the provincial secretary of the United Trades Committee.

MONUMENT TO M. DUBAN.

A SUBSCRIPTION has been opened in Paris to erect a monument to M. Felix Duban, at the office of the Central Society of Architects, 23, Quai de l'Horloge, and at the École des Beaux Arts. A report of the proceedings on the occasion of the funeral of M. Duban, and the addresses then made, edited by M. César Daly, has been published, and will be found very interesting.*

PRIVATE BILL STANDING ORDERS.

THE commencement of legislative action in relation to the private Bills for railways and other works, which Parliament is petitioned to authorise by the conversion of Bills into Acts, in the session of 1872, has been entered upon with a scrutiny by Parliamentary authority into the proceedings already taken, and whether the requirements of Parliament have been complied with up to this point, by the promoters of private Bills. The examiners on Standing Orders, Messrs. Frere and Robinson, stipendiary Parliamentary officers, have thus commenced their sittings.

On the first day the examiners' lists embraced the first sixteen Bills on the general list, and contained six railway Bills, and ten others, each of a different character from the other nine; as for instance, the Aberdeen District Tramways, Abraham Kill's Trust, All Saints' Church, Cardiff, Bannow Slob Reclamation, &c. None of the Bills were considered of much importance, or expected to excite much inrerest. In numerous instances when Bills are called by the examiner, there is no appearance on the part of promoters, from failure to have lodged the deposit, or the abandonment of their respective schemes from some other cause. The proposed new line to Brighton is among the dropped Bills of the session.

THE EDUCATION OF THE ENGINEER.

TOWARDS the close of the address made by Mr. Hawksley on taking the chair for the first time as President of the Institution of Civil Engineers, an address which will be deemed by some retrogressive in parts, he made a few useful observations on the subject of professional education, addressing them, he said, rather to each one of the 200 students of this Institution who happened to be present, than to the members who had acquired and usefully employed that peculiar knowledge by which they are severally known and distinguished.

To the students, then, the President said,—1st. Of all things, do not attempt too much. 2nd. Keep up and augment your knowledge of mathematics and the applied sciences, especially of those sciences which are most needed in that walk of the profession which you have selected for your own path; but again, I say, do not attempt too high a flight, for if you do you will never become a practical man. 3rd. Do not let your French grow rusty, and acquire German, if your leisure and aptitude are sufficient for the purpose, because your future vocations may be in countries in which these languages are either habitually spoken or are in considerable use. 4th. Acquire in the office, and by the study of esteemed works, a knowledge of form and design. 5th. But bearing in mind that you will never become a practical engineer on theory alone, take every opportunity which presents itself of becoming apt in surveying and levelling, and in the methods employed in the setting out of works; learn the uses and applications of tools; make yourselves able to distinguish a good material from a bad material, good workmanship from bad workmanship, sound ground from treacherous ground, good puddle from bad puddle, good mortar from bad mortar, and a good workman from a bad workman. This knowledge is not to be obtained in a school, a college, or an office, and cannot be learnt from books. 6th. Make yourselves acquainted with every description of plant, and all the appliances and contrivances which an experienced contractor employs for the purpose of rendering a paper design into a substantial construction. 7th. Keep brief treatises on geology and chemistry always at hand, for some acquaintance with these sciences cognate to engineering is, in the present day, almost essential. 8th. Practise as much as possible the art of mental computation, for this will give you the means of almost intuitively arriving at determinations on questions of cost, and of at once seizing on the best of several alternative plans or methods. 9th. Be not afraid of soiling your hands or dirtying your boots, but be in every other respect—in thought, feeling, and conduct—a gentleman.

* Funérailles de Félix Duban." Paris: Ducher & Cie. 6, Rue Sorbonne. 1871.

IRON PIPES FOR HOUSE-DRAINAGE.

IN the opening address, already referred to, Mr. Hawksley said,—

On the subject of the removal of the sewage of towns, no new suggestions of importance to the professional engineer have recently appeared, nor, indeed, does it seem that in this department of municipal improvement much remains to be accomplished. It is, however, worthy of remark, that in house construction it seems desirable to abandon the use of earthenware tubes with numerous and imperfect joints, and to substitute the use of iron pipes, with few and perfect joints, care being taken to provide a sufficient number of flanched or tightly-stoppered branches, to afford the means of access to the interior. By this simple arrangement, the escape of foul water and fœtid gases from the drains into the lower stories of our dwellings may be effectually prevented, and it will become a comparatively easy matter to apply, in connexion with such pipes an effective apparatus without the house for preventing the access of contaminated air from the main sewers. In many cases, the so-called "ventilation" of the sewers is much neglected, and invariably with the natural result that the pent-up sewage gases make their escape at the place of greatest pressure or least resistance, and commonly into some house towards which the sewer ascends.

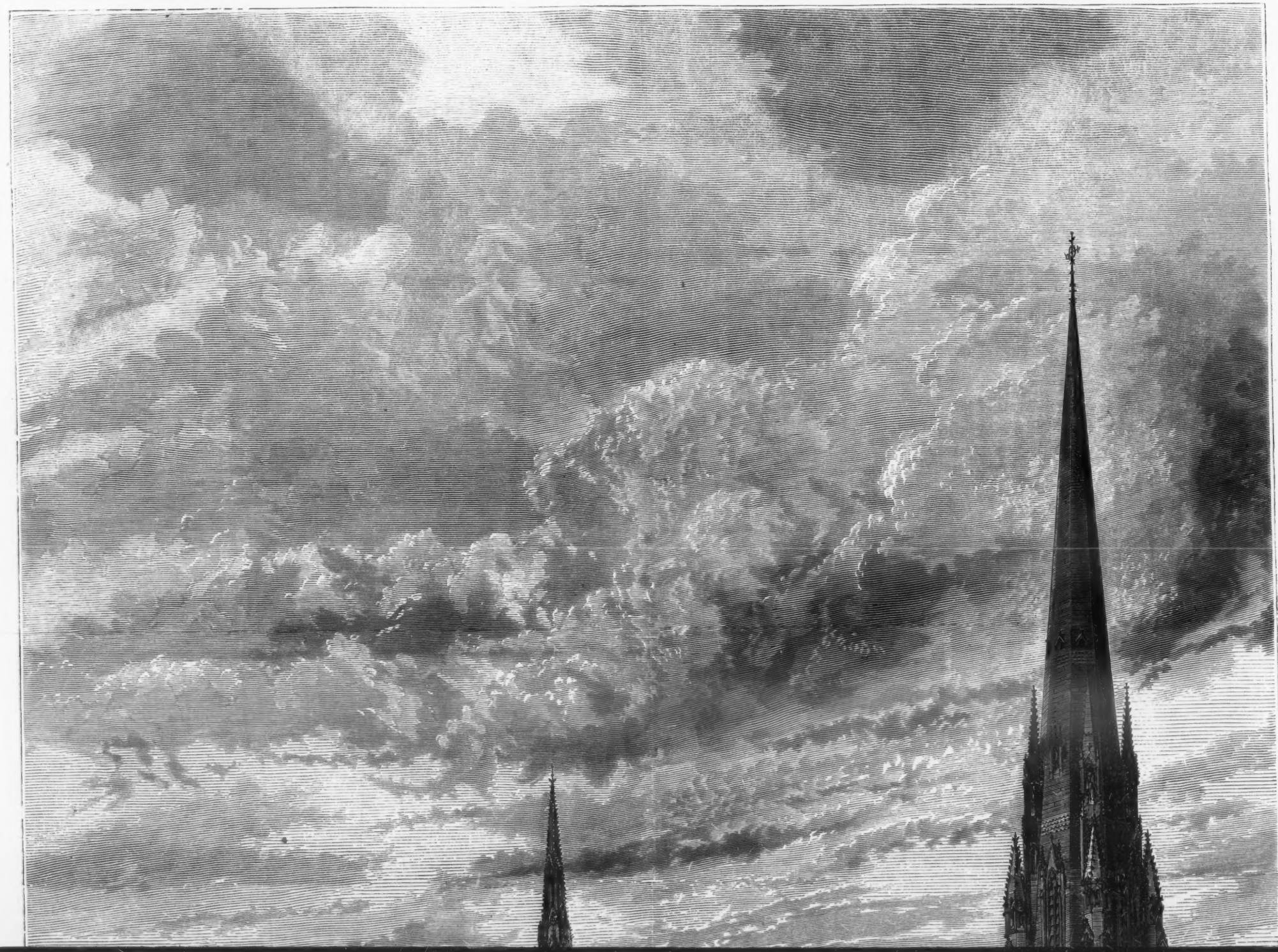
THE WHITTLESEY WORKHOUSE COMPETITION.

As many as twenty-five different sets of designs were submitted for this competition, with estimates varying from 4,000*l.* to 10,700*l.* Several of these were, either from excessive cost or inelegance or inaptitude of design, deemed to be altogether unsuitable; and after examination of the remainder, four were in the first instance reserved for further consideration,—viz., those by Messrs. Nelson, of Leeds; Mr. Ladds, of Bedford-row; Mr. Oldfield, of Westminster Chambers; and Mr. Peck, of Gordon-square; estimated to cost, respectively, 5,000*l.*, 4,500*l.*, 4,550*l.*, and 4,000*l.*

Eventually the design of Mr. Peck was selected conditionally on the contract for the building being accepted by a builder (to be approved of by the guardians) at a contract price satisfactory to the Board.

ST. MARTIN'S CHURCH RESTORATION, BIRMINGHAM.

ONLY eight sets of drawings were sent in, and from these the designs by Mr. J. Chatwin (1), Mr. W. Hale (2), and Mr. Edge (3), have been selected for premiums. In Mr. Chatwin's design, which is to be carried out at a cost of 12,000*l.*, the west, together with the north and south, walls of the old church are retained; but the whole of the east end of the building is subjected to alterations, which have for their object



the lengthening of the edifice, with the addition of providing choir, vestry, and organ-loft at the north-east angle, and a vestry; and at the corresponding south-east side, the nave, hitherto a narrow span, is considerably widened, and the aisles undergo a corresponding reduction. At the east end a lofty arch, with bracketed pillars, connects the chancel with the nave. Short transepts are planned, with the object of providing gallery seats for the school children, and affording the extra accommodation which the abandonment of the present unsightly galleries necessitates.

In Mr. Hale's design the present setting out of the nave is maintained. The roof is open timbered,—a plain and effective design. Chiefly owing to the adoption of ridge roofing for the aisles, the elevation is more striking than that of the selected design, and more desire to adhere to the original design appears to be shown than is apparent in Mr. Chatwin's drawings.

LEICESTER MUNICIPAL BUILDINGS COMPETITION.

INQUIRIES are being made why the design by Mr. Barnard, to whom the first premium was awarded, is not being carried out. Some of our Leicester friends will perhaps explain.

CAMBERWELL VESTRY HALL.

ON Wednesday in last week the selection of the plans was made. The votes were by a show of hands, and stood as follows:—

Nil Desperandum	1	—	—		
Thoro'	11	8	—		
Experience	1	—	—		
Civis	23	23	24*	30	31
In Foro	15	10	10	—	
Well Considered	23	25	24*	14	—
Excelsior	7	—	—	—	—
A l'œuvre, &c.	24	26	25	—	26

* Ties.

On opening the sealed letters "Civis" was found to be Mr. E. Power, of Walbrook Buildings, City; and "A l'œuvre," &c., Messrs. Berriman, of King William-street. Mr. Power will carry out his design if tenders do not exceed the estimated cost of 8,000*l.* (which is made a special resolution of the vestry), and the works will proceed at once.

THE PROPOSED SCHOOL-BUILDINGS FOR WORCESTER.

IN an article on this subject in the local *Herald*, a correspondent suggests the desirability of the Worcester School Board seeking professional advice in the selection of designs. He says:—

"Upwards of thirty sets of plans have been submitted, derived from architects in the city and from London, Birmingham, Manchester, and elsewhere; the various designs being exhibited for public inspection at the Guildhall. However able the several members of the School Board may be in their various professional pursuits, they can scarcely be expected to know individually as gentlemen, or collectively as a Board, sufficient of the arts of architecture and construction to enable them to fairly and satisfactorily adjudicate upon the labours of upwards of thirty architects and the merits or demerits of their plans and designs."

Another correspondent states that certain plans which he can name were not deposited until the second day after the latest day for deposit, namely, the 30th ult.; and yet that these plans are included with the others for consideration of the Board.

ORDNANCE MAPS.

SIR,—Would it be possible for the officials having these maps in hand to expedite the publication a little? Admittedly they are splendid works in respect of accuracy of delineation, and are invaluable as bases of other maps and plans, and for reference; but, still, the time occupied in their preparation and publication is something alarming. The other day, observing an advertisement of a "new" series of plans of London, on a 25-in. scale, being published, I sent for a sheet, and had it coloured and mounted, for my office; but what was my surprise, upon examining it carefully, to find the notification that the survey was taken 1862 to 1865, and consequently when published it was already out of date! An entire line of railway, destroying many dozens of houses, had been made in the interim, and was not shown even as projected, and various other alterations which had meanwhile occurred were equally, of course, left out.

However carefully these plans may be taken, and whatever other care may be bestowed in the plotting, engraving, &c., it never can be contended that so great a lapse of time is necessary before publication. This 25-in. scale is now going on gradually over London; but who can tell what proportion of your readers will be alive at the finish if this is the rate of progress?

HIERONYMO.

BUILDING IN SOUTH YORKSHIRE.

THE building trade in Sheffield and other South Yorkshire towns has during the past year been fairly brisk, and there is now a large amount of work on hand.

New printing-offices are in course of erection between High-street and the Hartshead, for the use of the proprietors of the *Sheffield Daily Telegraph*. They are entirely of brick, and will comprise printing-offices, reporters', &c., rooms, and all other conveniences. Mr. J. Rogers is the builder.

The erection of the new music-hall in Barker's-pool, Sheffield, is going on favourably, the slaters having just finished their work in time. The building itself externally has a somewhat heavy, overbulky appearance, but as the masonry gets in order and the scaffolding disappears, it will doubtless show to better advantage. When completed, one of the finest organs in the world will be placed in the great hall. An air-shaft is now being erected at the south-east corner in Burgess-street. Messrs. Longden & Sons are the builders; Messrs. Badger & Holmes, joiners, &c.; and Mr. Bissett for plumbing work. This edifice is expected to be ready by Christmas, 1872, and will be devoted to concerts and other entertainments of the very highest class.

Messrs. Brown, Bailey, & Dixon are erecting with the greatest possible speed new works at Attercliffe, near Sheffield, where they will carry on business as steel manufacturers, spring-makers, ironfounders, and makers of all kinds of railway materials. The works cover 13 acres of ground, and will employ about 1,500 men. There will be a frontage to Milner-road, of about 400 ft. The shops are, machine and buffer shop, hammers, smith's shop, wheel shop and forge, rolling-mill; Bessemer steel-house, to turn out 1,200 tons per week; and a rail-mill, which is to be the largest, or one of the largest, in England. Some of the shops will be ready next week, although the works were only commenced about five months ago. It is stated that Mr. George Brown (who is related to Sir John Brown) has designed the whole place himself, and has had it built under his supervision, the plastering being done by Mr. Unwin.

Mr. William Wostenholm, lately of Burgess-street, has just removed to a newly-built brick block of warehouses, workshops, &c., in Holly-street, which occupy the site whereon Messrs. Binney formerly carried on business as hammer, &c., makers. A new grinding-wheel has just been erected by Mr. Joseph Gaunt, in Cambridge-street.

New schools have been built very recently (and in some cases are yet unfinished), in Alderson-road, by Clubley & Stringfellow; in Hodgson-street, by Mr. Butler; in Pea Croft (ragged schools), by Mr. J. Butler; new schools and meeting-house for the Friends, in the Meet-house-lane; Pitsmoor schools altered by Mr. Shaw; new Wesleyan schools, Prospect-street, Walkley; Roman Catholic schools in St. Charles-street, Attercliffe, and some others. Messrs. J. H. Andrews & Co. are about completing the erection of the "Toledo Steel Works," at Neepsend, Sheffield. These works occupy over two acres, and have a frontage to the street of about 535 ft. They extend back to the river. Messrs. Sanderson, Brothers, & Co. are themselves building some extensive works at Darnall; and it is stated that they intend to concentrate their business there. Messrs. Caumell & Co., Limited, have built a new forge, to be used as an armour-plate mill; and an extensive forge is in course of erection at Messrs. Vickers, Sons, & Co.'s, Brightside. It is stated that both the last-named firms have put down the necessary apparatus to work some of their furnaces with gas, on the Siemen's patent principle. Messrs. Nixon & Winterbottom, Broomhall-street, have just rebuilt part of their works; Messrs. John Brown & Co. are putting down additional furnaces; Messrs. Newbold & Co., Newhall, have erected new works for saw-making; and Messrs. Firth & Sons, with many other Sheffield firms, have just completed alterations suitable for their increasing businesses. New schools and church are being erected at Spring Hill, Sheffield, for the Roman Catholics; and the Midland Railway Company are erecting extensive new stabling in Saville-street, Mr. Saul being the builder. A very considerable number of other undertakings of importance are also on hand, in various parts of South Yorkshire; and the amount of private buildings is and has been very large indeed. A number of villas has been erected in Westbourne-road, Newbould-lane, Shortridge-road, &c., Sheffield, and a great number of smaller houses at Heeley, Walkley, and Attercliffe. It is stated that the slaters and other branches intend to go in for the nine-hours very shortly.

The price of mortar has been raised by some firms 6d., in consequence of the advance in the cost of coals.

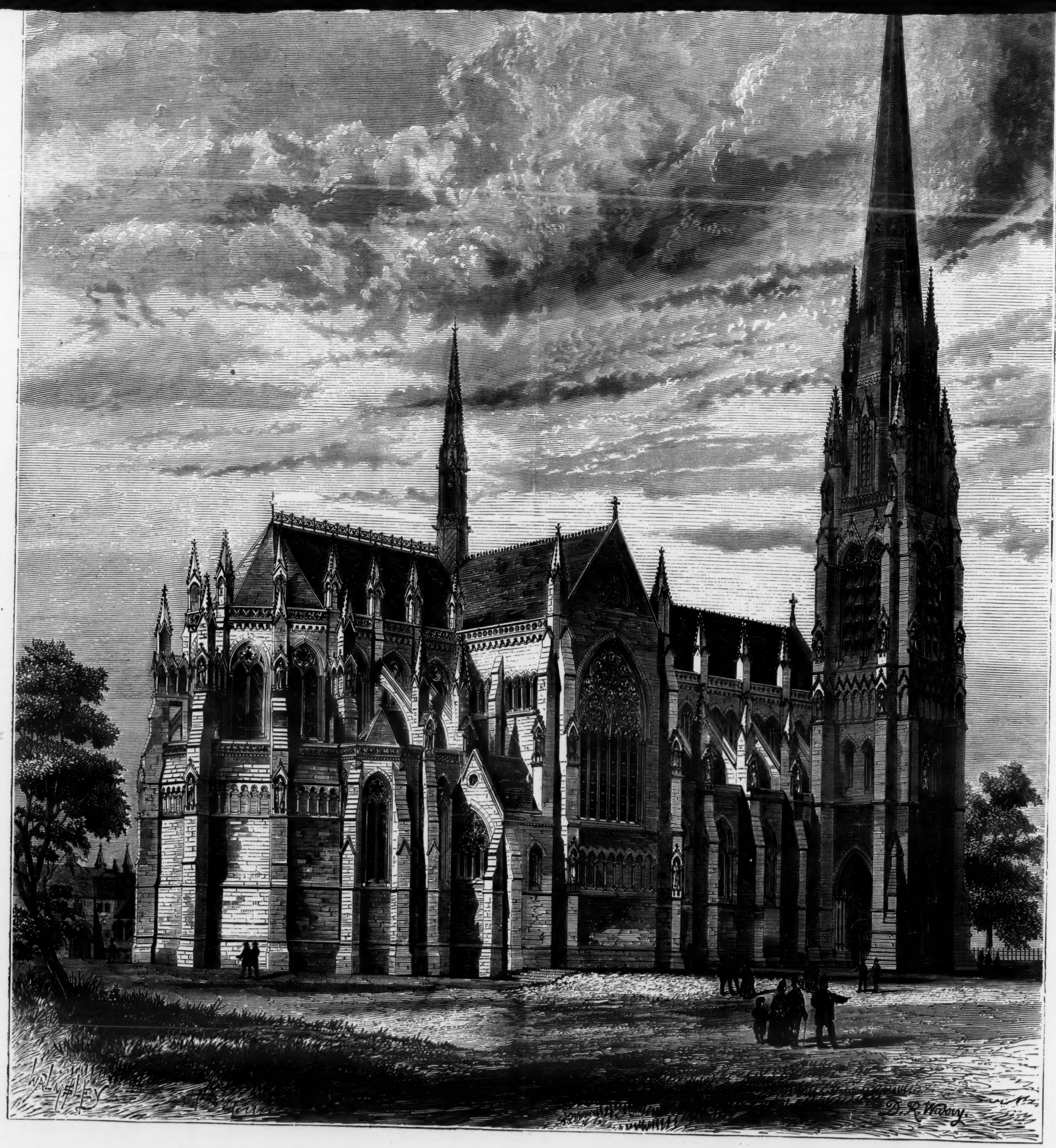
THE NEW (R.C.) CHURCH OF OUR LADY AND ST. PHILIP, ARUNDEL.

NOTICES of the progress of this church have from time to time appeared in this journal and in other papers, and occasionally it has been designated a cathedral, which it may be as well in this place to correct. It has not, and aims not at, more than the character of a parish church, of which there are so many and such splendid examples in the ancient fabrics of that class spread over the kingdom; and this church being founded and erected at the instance of the Duke of Norfolk, in the ancient ducal borough of the family he represents, being within a stone's throw of the famous Fitzalan Chantry and the old Church of St. Nicholas (the works of his ancestors), and grouping in the view of Arundel with the Castle, it would seem only natural, in the fitness of things, that a certain dignity and importance should be expressed in a structure that may be said to have a representative character like this.

The Duke, having chosen for his architects Messrs. Joseph A. Hansom & Son, and for builders the Messrs. Myers, the first work of throwing in concrete for the foundations was begun on the 27th of December, 1869; and although a very serious interruption took place in having to carry the foundations down to the solid chalk rock, which in some instances was as much as 50 ft. below the surface of the ground; yet, while we write, the building is well-nigh ready for the nave roof-plates, some 70 ft. above ground; most of the exterior and some of the interior carving being done; the walls being 3 ft. and 3 ft. 6 in. thick (those of the tower much thicker), and faced with ashlar stone inside and out. The progress has been steady and regular, an evidence of the excellent arrangements and management of the builders.

The view of the church which we insert this week will give a good general idea of the arrangement. It is cruciform in plan, having nave and aisles to the west of the transept, and choir and chapels to the east. At the north-west angle the tower stands in the place of porch, and at the south-west angle is an octagonal baptistery projecting from the line of the south wall. Besides the entrance under the tower there is a great western portal, and in each transept a smaller door of admission to the church. At the south-east angle will be the sacristies, lying between and communicating with both the church and the presbytery. Within the church, at the west end is the large organ-loft, raised high on stone groined vaulting, and with carved stone parapet front. The whole of the church, the choir, the three chapels, the baptistery, and tower-porch, are to be groin-vaulted in stone ribs and bands and chalk filling.

The dimensions of the church are as follow:—External length from east to west, 200 ft.; interior, across the transept, 94 ft.; width of nave and choir, 33 ft.; width of nave aisles, 12 ft.; width of transepts, 27 ft.; length of choir, 52 ft.; length of the chapel immediately on each side of the choir, and open to it by archways, 34 ft.; height to ridge of nave groining, 72 ft. The groining of the nave, choir, and transept arches springs from a level of 50 ft. from the floor. The flêche, or sanctus bell-turret, rises to the height of 140 ft. The spire is intended to be 270 ft. to the apex. The north transept window (seen in the view) is 37 ft. by 18 ft., sight measure. The diameter of the rose-window at the west end, 23 ft. 6 in. The church is intended to be opened during the present year.



THE (R. C.) CHURCH OF OUR LADY AND ST. PHILIP, ARUNDEL, SUSSEX.——Messrs. Joseph A. Hansom & Son, Architects.

WATER SUPPLY IN MARGATE.

ONLY a few years ago the entire water-supply of the inhabitants of Margate was derived from wells, sunk but a few dozen feet down into the chalk, which is here from 900 ft. to 1,000 ft. thick; and these wells—public and private—were often within a very few feet of some neighbouring cesspool. Percolation, no doubt, went on continuously, day and night, from these cesspools into the wells, for no one in Margate then or now ever thinks of lining a cesspool with bricks, or of making it water-tight; and if this did not affect the death-rate, it must be supposed that filtration through the greater or less density of the chalk tended to disarm the exudations of the cesspools to a great extent of their noxious qualities.

But the rapid growth of the town, and the perception by some of the inhabitants that, sooner or later, this comfortable and independent arrangement, of every man having his own cesspool and his own well, must inevitably break down, led to the proposition being made to the local Board of Health (Margate is a *corporation* now) that they should construct waterworks in the neighbourhood for the supply of the town; but the local Board rejected the proposition, and refused to expend the public rates upon any such visionary scheme. The matter was then taken up by a few private individuals, and they proceeded to form a Margate Waterworks Company (Limited); but the local Board would not hear of it, and point blank refused to grant permission to the new-born company to lay down their water-pipes in the streets. Thereupon the promoters of the scheme, nothing daunted, went to Parliament for powers to enable them to do what the local Board had forbidden; and to Parliament the local Board followed them; but there was some little hitch in the opposition offered by the local Board, who at first did nothing, until the time for lodging appeals had nearly gone by, and then made such scrambling haste that the resolution directing their legal representative to appeal was found to have been passed at a meeting of which the statutory notice had not been given quite soon enough to render it legal, and thus the opposition of the local Board fell through.

And so the Margate Waterworks Company got their Act, and Messrs. Docwra & Son, of Ball's Pond-road, undertook the contract for the works.

There was no difficulty in getting water at the spot chosen, close by the famed Tivoli Gardens;—a main shaft of 13 ft. in diameter and 50 ft. deep, with headings of an aggregate length of 400 ft., giving a yield of 200,000 gallons per diem,—equal to about 20 gallons per head of the population. The supply is continuous day and night throughout the town, and the analysis of the water is,—

Solid Matter per gallon.	Loss by Ignition.	Hardness before Boiling.	Hardness after Boiling.
45·92	3·30	18·31	10·35

The shares of the company are 10*l.* each, and its capital 16,000*l.* Very great difficulty was at first experienced in placing the shares, and many were offered at 8*l.* and 9*l.* each, that would now be esteemed cheap at 20*l.* The annual dividend is limited to 10 per cent., and the directors are making a move to increase their capital, and enlarge and extend their works.

Meantime, most of the public wells have been found to be more or less—and *more* rather than *less*—affected by infiltration of sewage matter, their brightness and clearness and softness have all been shown by analysis to cover very unmistakable dangerous qualities, and (not without some little opposition, however, on the part of the inhabitants, with many of whom these deleterious waters were in particular favour for the making of tea) the authorities have very properly had them closed.

And now the scene changes. The Town Council (the Local Board of the day) see that their opposition policy of a few years (about ten) ago was wholly wrong,—that the water supply of the town ought all along to have been in their hands, instead of in that of a private company; and now in the days of the success of that company, the Town Council have been making overtures to them to permit a purchase of their property for the benefit of the inhabitants; and so earnest are they in this matter, that they have within the last few weeks passed a resolution affirming the proposition that it is desirable for the town to possess the waterworks, and *actually offering the company* 32,000*l.*—just double their capital—for their interest therein.

The moral to be drawn from this plain statement of the facts is calculated to be of service to oppositionists upon local boards even of the present day. Whether the Margate Waterworks Company will sell out for double their invested capital remains to be seen. Rumour says that they will not.

APPOINTMENT OF ENGINEER FOR THE BRUTON DRAINAGE.

A CORRESPONDENT complains that having made an application for this appointment, and taken some trouble in the matter, he received intimation from Mr. Henry Dyne, by an open post-card, that his application "was not entertained." The complaint is a perfectly just one. Properly qualified candidates for such a post are certainly entitled to courtesy.

MEMORIAL CHAPEL TO THE LATE EARL OF DERBY.

A CHANTRY or memorial chapel, containing a statue of the late Earl of Derby, has been added to Knowsley Church. The new chapel has been inaugurated. It forms an addition to the north-east portion of the church, and has been erected at the expense of a number of friends of the late earl resident in the immediate neighbourhood. The design was furnished by Mr. Paley, of Lancaster. The chapel is built of red sandstone, and opens into the chancel by means of three arches, and into the transept by two arches. The groined roof is of pitch pine. The columns supporting the arches are of limestone, and the floor is partly of limestone and partly inlaid with tiles. The building will shortly be further enriched by several stained-glass windows. Around a portion of two sides of the chapel there are a number of carved seats of Dantzic oak, which are intended for the accommodation of the members of the Derby family who attend service at the church. In the middle of the chapel stands the monument erected by the tenantry. It is in the form of a recumbent statue of the late earl, by Noble, in white marble, and resting on a carved tomb of white stone. The statue is said to be an excellent likeness. It represents the late earl attired in his robes of Chancellor of the University of Oxford, reposing as in the sleep of death. The four sides of the tomb will be enriched with the arms of the Derby family. The total cost of the memorial chapel is about 3,000*l.*, of which nearly 1,000*l.* have been expended on the statue and tomb. The work has been carried out by Messrs. Burroughs & Son, builders, Liverpool.

THE LIVERPOOL FREE PUBLIC LIBRARY AND MUSEUM.

THE local Library and Museum Committee have just issued their report for the year ending on the 31st of August last. During the past year (they say) the Institution has pursued its course of usefulness to the utmost extent which the resources and space at the disposal of the committee have enabled them to go. The success of the autumn exhibition of pictures has been beyond their most sanguine expectation. The exhibition opened on Saturday, September 2nd, and closed on Saturday, November 18th. It was attended by 22,725 persons, besides holders of season tickets, numbering 313. The number of pictures exhibited was 887, of which were sold 235, at prices amounting in the whole to 6,395*l.* 2s. 6d. The committee have purchased, on behalf of the Institution, for the permanent gallery, pictures to the value of 500*l.*, and are prepared to devote a larger sum for the same purpose next year.

The number of volumes issued from the reference library during the year has been 507,335, against 620,124 in the previous year. This diminution is partly accounted for by the closing of the library for several weeks.

During the year 2,038 volumes of books have been added to the library.

In reference to the museum, the following statistics are given:—Day visitors: 1869-70 (52 weeks), 446,473; 1870-71 (49 weeks), 362,657; decrease in 1870-71, 83,816. Evening visitors: 1869-70 (26 nights), 54,473; 1870-71 (25 nights), 42,730; decrease in 1870-71, 11,743. Total day and evening visitors in 1869-70, 500,946; 1870-71, 405,387; decrease in 1870-71, 95,559. Average of seven preceding years, 473,435; total of 1870-71, as above, 405,387; decrease, 68,048. The attraction of the museum not only brings visitors from the town itself, but the numbers have been largely swelled by excursion parties from the manufacturing districts. These fluctuate from time to time, according to the season, the weather, the wide extent of choice offered by the ever-increasing railway system. A cold, wet summer deters multitudes, whom a fine warm season would bring over.

A NEW SYNAGOGUE FOR SHEFFIELD.

THE corner-stone of a synagogue which is being erected by the Jewish community in Sheffield, has been laid by the Rev. A. L. Green, minister of the Central Synagogue, London. The present synagogue in Fig-tree-lane has for some time past proved inadequate to the requirements of a congregation much larger than was the case a few years ago: and, besides this, the lack of school accommodation has been very much felt. The new building is in North Church-street. The basement will consist of a school-room accommodating 60 children, with other rooms, approached on the level from North Church-street, and having a second entrance by a flight of stairs from St. Peter's-close. On the ground-floor is to be the synagogue, 38 ft. long by 30 ft. wide, fitted with pews along each side, and having the reading-desk or almemor in the centre. At the east end, in a semicircular recess, is to be placed the Aaron Hakodesh or Ark, containing the sacred rolls, on which are inscribed the Books of Moses. Over this will be a small stained-glass window, having the Ten Commandments worked thereon. A staircase in the lobby will lead to the ladies' gallery, which extends over the lobby. A teachers' residence and board-room are to be attached. The whole is to be built of brick, and in Early Gothic style. The roof will be open-timbered, and the seats and gallery front will be of pitch pine. The synagogue will accommodate about 230 persons. The builder is Mr. Wade; the joiner, Mr. Flowerday; and the works are to be carried out under the superintendence of Mr. Mitchell-Withers, the architect.

The total cost is estimated at about 1,800*l.*

NORTHERN ARCHITECTURAL STUDENTS' SOCIETY.

A MEETING of this Society was held on Tuesday evening last, Mr. W. L. Newcombe (president) in the chair. Some months ago Mr. Ralph Thompson, of Newcastle, offered to present to the Society a gold medal, to be given to the author of the best sketch or drawing from an existing building. The competition took place a short time ago, and the drawings submitted were sent up to Mr. W. Burges, of London, who kindly undertook the office of adjudicator. His award gave the medal to Mr. Joseph Oswald, of Newcastle, for a measured drawing of the choir of Lanercost Priory, Cumberland; and a present of books, as second prize, to Mr. W. H. S. Thompson, of Newcastle, for a sketch of the Dacre Tower, Lanercost. The president, in an appropriate speech, presented the medal to Mr. Joseph Oswald, who briefly replied. The medal is in the form of a star or Maltese cross, and has on one side the armorial bearings of Newcastle, and on the other a suitable inscription. After the presentation a paper was read by Mr. G. H. Morton, architect, and led to a short discussion.

THE NEW VICTORIA HALL IN SUNDERLAND.

THE newly-erected "Victoria Hall and Temperance Institute," Toward-road, near the Extension Park, Sunderland, has been opened with *éclat*. The new hall has been erected to supply the need, long felt in Sunderland, of a large public room capable of holding 3,000 persons; and as it is constructed in the theatre fashion, it is adapted for large public meetings, concerts, and musical and dramatic entertainments. The building fund has been supplied by a company of 1*l.* shareholders, on the limited liability principle, the Sunderland Temperance Society holding shares to the amount of 2,000*l.*, or one-fourth of the total cost of that portion of the building now completed,—the large hall, lobbies, and retiring-rooms. The cost of the completed portion was 8,000*l.* The principal

entrance is from Toward-road, whence a flight of steps leads to the floor of the hall, through a corridor. From the entrance level, a staircase leads to the dress circle, with its spacious lobby and retiring-rooms. The circle is fitted with numbered arm-chair seats, covered with red velvet plush, and a partition of glass separates the circle from the lobby. The platform is somewhat on the fashion of that in the New Town-hall of Newcastle. The original design of Mr. Hoskins could not be carried out for want of funds.

The whole of the various works have been carried out under the supervision of Mr. Charles Cobham, as clerk of the works. The contractors were,—for masons' work, Messrs. Hopper & Oliver; bricklayers', Messrs. Sydney & Parkin; carpenters' and joiners', Messrs. David & John Rankin; plumbers', Mr. Henry Tonkinson; plasterers', Messrs. J. Montgomery & Son; slaters', Mr. Robert Preston; painters' and glaziers', Mr. G. N. Arnison; gasfitters', Mr. J. J. Kirtley; upholsterers', Messrs. Hobkirk, Smith, & Whitecross.

MID-LONDON RAILWAY.

THE ESTIMATES.

IT may safely be assumed that, as so much expense has been already incurred in the survey of the line, in the scheduling of an immense amount of property, and in other outgoings, the promoters are quite prepared to find the necessary deposit, and to proceed, if opponents, legal forms, and the Legislature will permit them, to the execution of this important project.

In accordance with the Standing Orders of Parliament, the estimates of costs for the construction of the line were duly deposited on the 30th ult. for the 31st.

The Mid-London Line, it may be proper to recall, is to be promoted by two Bills, the more important being the eastern section. The names of five gentlemen of property appear on the Bill as constituting the nucleus of the company. Railway No. 1 is laid out as rather more than 1¼ mile in length, to commence on the south side of Oxford-street, about eight chains to the east of the Marble Arch, and terminating in the parish of St. Anne, Soho, in George-yard, occupied by Messrs. Crosse & Blackwell. The estimated cost of this portion is for 163,000 cubic yards of excavation, at 6s., 48,900*l.*; covered way, including road, bridges, and retaining walls, 59,000*l.*; accommodation bridges and works,—included in covered way,—culverts, and drains, 20,000*l.*; metallings of roads, 1,500*l.*; permanent way fencing, included in covered way, at 6,000*l.* per mile, 6,910*l.*; permanent way for sidings and cost of junctions, 1,000*l.*; contingencies, 15 per cent., 29,596*l.*; land and buildings, 6a. 1r. 16p., 390,000*l.*: total, 616,906*l.* Railway No. 2, of 1 mile 3 furlongs and 40 yards in length, extends from a junction with the eastern end of No. 1 to a junction in the parish of St. Sepulchre, with the London, Chatham, and Dover Railway. The estimated cost for this section is for works, 191,692*l.*; contingencies, at 15 per cent., 28,754*l.*; land and buildings, 7a. 1r. 10p., 480,000*l.*; total, 700,446*l.* Railway No. 3, of 6 furlongs 1 chain 18 yards, commences by a junction with No. 2, and terminates in Coleman-street, to the west of Moorgate-street. The cost of this line is estimated at 133,036*l.* for works; 19,956*l.* for contingencies; and 250,000*l.* for land and buildings, the land embracing 4a. 1r. 20p.; total estimate, 402,992*l.* Railway No. 4 commences by a junction at the end of No. 3, and terminates by a junction with the authorised Railway No. 1 of the East London Railway Company, in the parish of St. George in the East. The estimated cost for this section is, for works, 230,631*l.*; contingencies at 20 per cent., being 5 per cent. extra, 46,126*l.*; land and buildings, 7a. 2r., 410,000*l.*; total, 686,757*l.* Section No. 5 is a junction, 1 furlong 6 chains 10 yards, from Line No. 1 in the parish of St. Anne, Soho, to a junction with the authorised London Central Railway. The estimated cost of this section is 103,801*l.*, including 50,000*l.* for land and buildings. The sixth section is a junction of 1 furlong 8 chains 6 yards, in the hamlet of Mile-end Old Town, between No. 4 and the authorised East London Railway; estimated cost, 85,714*l.*

An important feature in this project is the formation of a new street in two sections; the first commencing at the angle formed by Gilt-spur-street and Newgate-street, and terminating in the parish of St. Stephen, Coleman-street, in the city of London. The second section is from the point just indicated to the junction of Commercial-street, Commercial-road, and Whitechapel High-street. The estimated cost of the works, contingencies, land and buildings of the streets, is, for No. 1, 443,000*l.*, and for No. 2, 957,000*l.* Part of the cost of the land and buildings for the new streets is included in the railway estimates already quoted.

The Bill and estimates for the western section of the Mid-London are again subdivided into two parts. Railway No. 1 is 2 miles 7 furlongs and 5 chains in length, commencing by a junction with the London and North-Western line at Willesden, and terminating in the parish of St. George, Hanover-square, on the east side of Park-street, near the west end of Oxford-street. In this section there are 37 road-bridges, and a railway-bridge, which, with retaining walls, are extimated to cost 102,000*l.*; the stations are estimated at 94,000*l.*; the total cost of works, 350,000*l.*; contingencies, at 15 per cent., 52,635*l.*; land (22 acres), and buildings, 338,000*l.*; total estimate, 741,535*l.* The second section, of 5 furlongs 5 chains, is from a junction between No. 1 and the London and North-Western Railway. This portion is estimated to cost 28,343*l.*, including 5 acres of land.

The grand totals embraced by the two Bills and the two sets of estimates are thus: in the eastern section, lengths, 5 miles, 4 furlongs, and 22 yards; for railways, 2,596,616*l.*; for two streets, 1,400,000*l.* Western section, 3 miles 4 furlongs 7 chains, estimated cost, 769,878*l.*, say 770,000*l.*; length of lines in all, 9 miles 7 chains 20 yards, estimated cost, 4,766,616*l.* This amount may possibly be considerably reduced by the Corporation of London, or the Metropolitan Board of Works bearing a portion of the expense of the new street from Holborn Viaduct to Whitechapel.

It is proposed to take powers in the Bills to underpin or otherwise strengthen all houses or other buildings within 100 ft. of the railway, after ten days' notice given to the owners, lessees, or occupiers of the houses or buildings to be underpinned, or otherwise strengthened, the company to be liable for inconvenience, loss, or damage, resulting from the exercise of its powers. If the owner, lessee, or occupier, gives a counter notice, disputing the necessity of underpinning, the question of necessity to be left to a civil engineer to be appointed at the instance of either party by the Board of Trade, the referee to be paid by the Company, and the other costs of the reference to be in his discretion.

LONDON ROOKERIES.

EFFORTS should be made to entirely sweep away the "rookeries" of London; *i.e.*, those large collections of narrow, close, unhealthy courts and alleys which we find grouped together in masses, at certain parts of town. A single court is no object, but in some districts we observe a perfect wilderness of them grouped in an unwholesome mass. Now, when there are Alsatias of this description, the indigent will always seek them, or be driven into them, and all our efforts to improve their physical or moral condition, will be frustrated from the nature of their homes. Let these dens then be rooted out entirely, and let new dwellings on new streets be erected in their place. We do not content ourselves with building model lodging-houses in good positions: we propose to destroy whole territories of slums, and lay out new streets on the sites. At first sight, even 500,000*l.* may seem insufficient to grapple with such a colossal undertaking; but well applied, it would effect much.

It has proved more than once in the recent history of London that, upon buying up a quantity of crowded low-class dwellings, and making a good wide road through the mass, the ground thus opened out on an improved scale has gone far towards repaying the cost. A most important consideration and valuable for this purpose! Now in London there are several masses of courts on which this principle could be tried. An Act of Parliament would be necessary, which is said to cost about 1,000*l.* Take, for instance, the block of courts right and left of Bedfordbury, between St. Martin's-lane and Bedford-street; the blocks of courts about Drury-lane, about Clare Market, &c.; another block of courts south of Cursitor-street, Chancery-lane; the rookeries around Baldwin's Gardens, about Laystall-street; the fifty acres of courts and alleys all in a mass between Aldersgate-street and Bunhill Fields, opening out of Upper Whitecross-street, Golden-lane, &c.; several acres of unwholesome courts in a block at the back of the Mint; and another block at Wapping between the London Docks and the river. These constitute the chief mass rookeries of London, and several have been remarked upon from time to time by the *Builder*. Our proposal is to buy them up, or the worst of them; then to level every building to the ground, lay out the land with good 40 ft. roads, and either build improved and larger dwellings there, or let the ground to builders. The ground or new buildings, as the case might be, could then be sold, and the net proceeds embarked in a fresh undertaking. It is doing only half the work to erect model lodging-houses here and there if the great bulk of the poor are still left festering in public stews. Let us sweep away these stews altogether.

Half a million of money would not indeed buy up all the courts of London; but it would do a very great deal by being invested and reinvested in the way just mentioned; more than might be thought. We submit that it will be difficult in the extreme to do the greatest good to the greatest number of people in any other manner. This would be a permanent and not a temporary benefit; it would affect the very poor most, and would indirectly benefit the whole capital. Building model villages, on the contrary, however desirable, would leave the poorest still untouched in their dens; and it must be remembered the bulk of London working-men, however willing to live out of town, find it inconvenient or impossible in practice so to do.

H. & R. P.

EXPERIMENTS IN PAVING.

THE St. George's, Hanover-square, Works Committee have considered the question of the paving works necessary during the ensuing year. A report was read from a Committee of View recommending that in answer to a memorial from the inhabitants of Old and New Bond streets asking for asphalte in the carriageway on the east side of Old Bond-street, a pavement of asphalte be laid down from Piccadilly to Burlington-gardens, and the inhabitants called upon to set their coal-plates in an iron rim. The Committee of View also recommended that Piccadilly between Bolton and Stratton streets be paved with Victoria stone. The surveyor, in answer to some questions, said the Victoria stone appeared to be a mixture of broken granite and Portland cement. After it was prepared it was placed in a bath of silicate, where it remained for a fortnight, becoming impregnated with silica and extremely hard. He had seen the Victoria stone laid down in front of St. Mildred's, Poultry, the only piece laid down in London, and considered it extremely durable, harder than York paving. The Committee decided to recommend the Vestry to adopt the report.

SEWAGE AND WATER SUPPLY.

HAVING suffered severely when young with fever, and since lost several friends, some of them men in the prime of life, who have left widows and large families to mourn their loss, and knowing others that are now sick with typhoid fever, I venture to pen these few lines.

During forty-five years, constantly having something to do in well-sinking, drainage, sewering, waterworks, &c., my experience has shown me that as gunpowder is dangerous when put in contact with fire, so is nightsoil when in contact with water, where old wells, drains, cesspools, and inferior traps, and badly-fitted water-closets, are allowed to remain in use.

I enclose you section, showing the drainage and water supply of a house on a small piece of land I purchased in Chippenham, Wilts, twenty years ago, and on investigation at the time I found a large number of other cottages in the same condition.*

Knowing the danger, and having a large body of workmen, also my own family, located there, I endeavoured, with other persons, to obtain a public water supply generally for the town; but, not succeeding, I sank a private well for the use of ourselves and workmen, procuring most excellent water from the deeper springs, and from this well most of the inhabitants of the town are now supplied.

* The section shows a well for the water supply, lined with rough pieces of stone, between the cesspits of two privies, the contents of which percolate to the water.

As to rivers, I well remember seeing fine salmon taken from the Thames between Isleworth Ferry and Richmond Bridge, and often watched the gradual pollution of its waters since with regret. The time will come, if not at hand, when it will be necessary for the Legislature to take further steps in the matter, both as regards the water supply and the disposal of the sewage from the dwellings.

Providence provides a sufficiency of good water in England for every creature thereof to drink; and it will be expedient in some districts where the strata are favourable to sink new wells to the deeper springs, stopping out all surface matter and water. In other localities it will be necessary to revise some of those old water-course and mill-dam rights, and also to substitute the steam-engine for the old water-wheel, so that the locked-up springs and pure water streams may be made more freely to flow for the use of the people?

With reference to the disposal of sewage, I think it would not only be a waste and loss to the country, but a sin to send it from our inland cities and towns to sea, for which it was not intended. As the grave is the great deodoriser of the dead, so is the earth to the excrement of the living.

The farm, England, is wisely arranged, with its parcels of fertile land, and also its portions of inferior soils, chalk downs, and sandy commons, left for the use of and improvement by man. And it contains also an abundance of the richest and most durable manure, if carefully husbanded, which ought to be conveyed to those soils placed by nature to receive it. And seeing what fine fruit, ears of corn, vegetables, and roots, were produced in the valley of the Thames, and by my father and others after the enclosure of Hounslow Heath, by the use of night-soil, urine, and contents of cesspools, I am convinced that in a reasonable time some of those unprofitable lands may be turned into fruitful gardens and paying fields in producing for the increasing population.

And if the Government and heads of families will still persevere in procuring for them good drainage, fresh air, wholesome food, and pure water, I think there need not be much alarm as to degeneration.

ROWLAND BROTHERHOOD.

THE NEW COURTS OF JUSTICE.

WE have received a long letter from Mr. Edmund Sharpe, expressing his approval of special parts of Mr. Street's design; but as it had already appeared in the *Times*, we cannot devote to it the space it would occupy.

SIR,—I have hitherto carefully abstained from all criticism on Mr. Street's designs, and have no intention of deviating from this course.

I regret, therefore, extremely, that the references to me in his recent pamphlet (many of which appear to me uncalled for, and very misleading) oblige me to take steps to make public the real state of the case as regards my position in the late competition.

I hope my answer will be in the hands of the printer this week, and in the meantime must ask your readers to hesitate before accepting the statements referred to.

EDWARD M. BARRY.

DESTRUCTION OF CRUMPSALL CHURCH BY LIGHTNING.

DURING a recent thunderstorm of great violence, St. Mary's Church, Higher Crumpsall, Manchester, was struck and set fire to. There was a want both of water and of fire-engines; and the interior was completely gutted. The edifice was built in 1859, from the designs of Messrs. Mangnall & Littlewood, of Manchester, architects. It was 87 ft. long and 57 ft. wide (inside measurement), and contained sittings for 770 persons. It was in the Decorated Gothic style. The tower and spire were added about six years ago, at a cost of 1,500*l.*, making the total cost of the building upwards of 6,500*l.* In the base of the tower was placed an organ, which, with the font and everything else in the building that could be burned, has been totally consumed. At the east end of the edifice there was a stained-glass window, which cost over 300*l.*, and another at the south side. Both of these have been completely demolished. One of Milner's safes, although it was exposed to the fury of the flames for some time, has preserved its documentary contents complete. The stone pillars of the church present the appearance of having been chopped with a ponderous axe.

The fire was first observed in the vestry, which is situated at the north-east corner of the building, and by some persons it is believed that the lightning struck this part of the church first. Others are of opinion that the spire was first struck, and that thence the lightning flashed down the conductor into the interior of the church, along a gas-pipe under the flooring, to the vestry, and afterwards to the rectory by an underground gas-pipe. Here it stopped by causing a slight breakage in the ceiling of the cellar, and without any other damage further than that of melting a small leaden pipe which supplies one of the upper rooms with gas.

The total amount of damage done is estimated at fully 3,000*l.*, which, it is stated, will be nearly covered by the insurance.

LIBERALITY IN WILTSHIRE.

SIR,—In the agricultural village of All Cannings, in Wiltshire, a reading-room has been established by the more influential inhabitants for the benefit of working men, and which it is proposed to make self-supporting, if possible, by means of members' contributions. In the same village some new buildings are in progress, and the workmen employed thereon are necessarily strangers in the neighbourhood; but they have been in the same employ nearly three years, and bear characters above the average, yet are denied the privilege of membership, and consequently the use of the room.

You as well as the *Times* have urged the necessity of providing places of evening resort for working men who had done their daily labour; and I write this to show, first, the opinion entertained of building operatives in out-of-the-way country districts; and, secondly, the fact that with all the talk about the difficulty of weaning men from the public-house or beer-shop, and getting them to spend their leisure time in a better way, they have in many instances only "Hobson's choice." T. P.

ST. PETER'S SCHOOLS, LONDON DOCKS.

THE schools lately erected in this poor and thickly-populated parish were recently opened by the Lord Bishop of London. The school buildings are three stories high, and afford accommodation for 600 children, namely, 200 on each floor. The ground story is for the infants, the first floor for the girls, and the top floor for the boys. The schoolrooms are 74 ft. long, 18 ft. wide, and 14 ft. high, and a class-room is attached to each, 19 ft. 6 in. by 18 ft. There are two entrances, one for the boys, and the other for the girls and infants. Two separate staircases have also been provided. Water is laid on throughout the buildings, and a lift for the supply of coals to the girls' and boys' schools has also been included in the general arrangements. Yards have been provided for both boys and girls, and are complete with the necessary offices. The buildings have been designed in as economical a style as possible. The exterior walls are faced with best stock bricks, relieved by bands of red and black bricks. All the windows have arches over them in red and malm bricks, with the exception of those to the boys' school, which have chamfered stone heads. A projecting parapet runs along the entire length of the building, and from the centre of the façade rises a gabled bell-cot, surmounted by a wrought-iron cross supplied by Messrs. Richardson, Slade, & Co. In a niche under the bell is a very beautiful carved stone figure of the Good Shepherd, from the studio of Mr. Farmer. The interior of the building has also been kept as plain as possible, the walls are all plastered, but the otherwise monotonous appearance is relieved by all the doors and windows having red and white brick arches over them, and all the windows have chamfered red brick sills. The wood girders carrying the floors are exposed to view, and are stained and varnished. The removable partitions between the school and class-rooms are treated in the same manner.

The corner-stone bears the following inscription:—"To the Glory of God, and the advancement of His Holy Catholic Church, in the religious education of His children, this stone was laid on the Festival of St. Peter, A.D. 1871, by the Earl of Powis, LL.D., High Steward of the University of Cambridge. C. F. Lowder, M.A., vicar. W. H. Martin, F. W. Paice, churchwardens of St. Peter's."

The contractor for the works was Mr. Ennor, and Mr. Whall acted as the foreman. The forms, desks, and class-room galleries have been supplied by Mr. Geo. Hammer, of St. Martin's-lane. The fittings for yard offices are from Messrs. Macfarlane's establishment. The gasfittings are being made by Messrs. Hart & Son; and a Gurney stove for each of the large schoolrooms has been supplied by Mr. Edwards, of Great Marlborough-street. Mr. J. R. Veall, of Wolverhampton, supplied the bills of quantities. The contract drawings were prepared by the vicar's brother, the Rev. W. H. Lowder, a former pupil of Mr. Butterfield, and now vicar of Alvanley, Cheshire. The buildings have been erected under the personal superintendence of Mr. Bowes A. Paice, of London, architect, who also supplied most of the working drawings.

MEETING OF BUILDERS IN LONDON.

WE understand that a large meeting of employers of labour was held at the Palace Hotel, Westminster, on Thursday, the 11th inst. It comprised deputations from every seat of industry throughout England and Scotland. The demands of the operatives having gone on from ten hours to nine, and from that to eight and a half, with an intimation from Mr. Scott Russell that that was only a step to forty-eight hours per week, in competition with sixty-five on the Continent, masters find it indispensable, it was said, to form a defensive coalition, and the meeting turned itself on the spot into an association of employers to arrange or resist the demands of trade-unions and other combinations of workmen. A statement was given in by each firm of the number of hands in their employment, and the aggregate proved to exceed 100,000 men.

CEMENTING WATER-TANKS.

SIR,—In answer to "Stagnum," in your issue of the 13th, twenty years' experience has taught me the following:—Two of sharp washed sand and one of cement will stick to brickwork best. To make it impervious, float it, and finish it in one coat, by watching it and working it with the hand-float as it is setting; then take some dry cement in your hand, and dust it over, to draw out the water; work it again with the float, and repeat this till it is too hard for the float, and then give it a thorough rubbing and pressing with the flat part of the plastering-trowel. By this plan I have completed a well 60 ft. deep, with the water streaming down the brickwork, and kept it all back by beginning at the top and working down. A. W.

SOME of the remarks on this subject in your last number (p. 33) are good and correct. The addition of a proper proportion of good gritty sand makes the cement better, say, in the ratio of 1 to 2. The Hafod-y-Weirglodd Company, Wrexham, have a good article for the purpose, being a pure silica in its component parts. FLUENS.

WEST LONDON SCHOOL OF ART.

ON Wednesday evening last Mr. Beresford Hope, M.P., presided over the annual meeting for the distribution of prizes to the successful candidates among the pupils of this institution, at 204, Great Portland-street. The gallery was decorated with a good collection of the productions of the scholars, including oil-painting and water-colour, chalk, and pencil drawings, besides many architectural designs. On the platform were Mr. Geo. A. Stewart, the head master of the school; Mr. Peter Graham, the treasurer; Mr. S. M. Hubert, the hon. secretary; and Mr. J. H. Donaldson. At the request of the chairman, the head master read the annual report, which was of an unusually satisfactory character, and showed a steady increase in the number of the students as compared with that of former years. Mr. Beresford Hope, who has somewhat "dropped" architecture lately, made an interesting address, and insisted upon the necessity of the mind being trained to a wise perception of harmony and beauty. Without this perception, he said, a state of things bordering on the ridiculous would be produced. Art designing had the salutary effect of imparting ideas of proportion, of size, and, he might add, of common sense. If, unlike those who lived in the country, Londoners could not enjoy the sight of the majestic waves, or the variegated landscape, they might

find compensation in endeavouring, by the aid of schools like this, to elevate and refine their minds. He wished to impress upon his hearers that the prizes were but a means to an end. Having regard to the number, he was able to say that out of 116 schools of art in England this was one of the best. In conclusion, Mr. Hope complimented Mr. Stewart on the ability he had displayed in conducting the school. The successful candidates were then called forward, and received the prizes. Mr. Grayson, Mr. Webber, and Miss Keeton, gained the most. The Treasurer, in proposing a vote of thanks to the Chairman, could not help noticing that manufacturers, who had so great an interest in the success of schools of art, did not pay them so much attention as might be wished.

COVERED CAB-STANDS.

AT the ordinary meeting of the Westminster District Board of Works, a letter was read from Colonel Henderson, the Chief Commissioner of Police, inclosing a sketch of a covering, which, with the concurrence of the Board and the Secretary of State for the Home Department, he proposes to erect over the cab-stand at Knightsbridge, near Sloane-street. Colonel Henderson, in his letter, set out that the Board would not be called upon to defray the expenses of lighting; that there would be a place at the east end of the stand for the sale of coffee and newspapers, and a refuge for persons waiting for the omnibus; while at the other end there would be a refuge for the cabmen. The cost of the stand, roofed in with glass in a horticultural fashion, Colonel Henderson estimates at about 700*l.*; and it was proposed, should the experiment prove successful to erect covered stands in other parts of the metropolis. Mr. Ridley hoped the Board would not surrender any of the public highway. The surveyor, in answer to a question, said he approved of the idea of the covered cab-stand. The Board decided to give the required permission so far as they legally can or may; with the proviso that the police authorities take all the responsibility, and remove the cab-stand covering at any time the Board call upon them to do so. Some years have passed since we first urged that protection should be given to cabs and their drivers.

CUTTING OAK TIMBER.

SIR,—In reply to the letter in the *Builder* of the 13th inst., I can give you some advice on the subject of "oak panelling."

I should select oak-trees known to be old and hearty, with clean, straight butts, from 15 in. to 20 in. in diameter; I should then have the bark taken off as they stand, and leave them thus till the winter,—the sap will then partially dry out, and make the wood a rich brown colour. As soon as they are cut down, have them sawn up at once into the lengths you require the panelling, 6 in. or 8 in. wide and 1 in. to 1½ in. thick. Be careful to cut out all the heart shakes, by having one cut through the centre of the log before edging the boards to the required width.

With regard to the drying process, stack the boards in a shed with a good draught through it, and load them down, with slips between each board, to prevent warping. If this be done they will be found to dry well and speedily, and they will not require to be exposed to the weather.

GEORGE MARSHALL, *Timber Merchant.*

SIR,—In reply to your correspondent, it is rather difficult to explain without diagrams; but I will try to do so. Cut the largest trees, bark them standing, in the spring, and fell them in the following winter, "if you wish to save the bark," but remember you lose nine months' seasoning of the wood (and there is, perhaps, too much made of this falling in the winter theory: it is seldom put in practice); cut off the longest length you require from the butt of the tree, and sell the top of the tree for a rougher purpose.

If the tree is large enough for the purpose, cut it into four, in sections, by drawing a vertical and horizontal line across the end, meeting in the centre. If too small for this, cut it into 4½-in. or 6-in. plank, as soon as possible after felling, and then stack *on end* out in the open: do not lay on the ground, but stand it as nearly *vertical* on its end as possible, and keep it *wet* during the first three months. If the weather is dry, well wet it with water poured on the top, and allowed to run down. Let the ends stand on a piece of quartering, to keep it out of the dirt, or it will be stained some distance up. After standing thus for some six months, after putting it in a dry place for some time, cut it into the scantlings you require, always bearing in mind that oak will, after this seasoning, shrink in, at least half an inch to a foot, in width and thickness. They should then be stacked, and stripped, and covered with spare boards, and weighted on the top, for at least six months,—as much more as possible,—in a covered shed, with plenty of air, occasionally turned over and shifted, till they are dry enough to make dust when planed, and not turn the shaving black. They will then be fit for use.

I should advise for the panels to be cut as *feather-edged* boards, in radial lines from the centre of the tree: it will be a waste of material, but will repay in the beauty of the wood, and the way it will stand without warping. Most of the panels of the stalls of our old cathedrals were rent *(not sawn)* in this way, and stand admirably.

ROBERT PHILLIPS.

THE NEW HOUSE THAT JACK BUILT.

A Sanitary Version for Grown Children.

TWELVE CUTS.*

PAPER'D and plaster'd and painted down,
Nicely placed in the skirts of the town:
This is the House that Jack built.

This is the roof and the soaking rain
Dripping right through in search of the drain,
In the New House that Jack built.

This is the nursery toss'd about,
Where smoke is kept in, and air kept out,
In the New House that Jack built.

This is the bed-room floor,—do you see?
And right at the end is the W.-C.,
In the New House that Jack built.

This is the gas-pipe, sectional view,
'Neath the floor, with a nail driven through,
In the New House that Jack built.

This is the view of the kitchen floor,
The maid, and her bed behind the door,
In the New House that Jack built.

These are the dogs and the ladylike cats
That would not harm the mice or the rats,
In the New House that Jack built.

This is the downward draught of the smoke,
Through the patent flue, designed to choke,
In the New House that Jack built.

This is the pump next the cesspit-wall,*
Showing the well-hole, source and outfall,
In the New House that Jack built.

This is a view of the stagnant drain,
Where gases rise and fall with the rain,
In the New House that Jack built.

This is the master, ill in his bed,
And that is the doctor at his head,
In the New House that Jack built.

This is the coffin and stately hearse
Of the luckless subject of my verse,
That died in the House that Jack built.

LIGHTNING AND CONDUCTORS.

SIR,—I have seen it stated in the papers that Crumpsall Church, near Manchester, which was destroyed by lightning on the 3rd inst., was furnished with a conductor. Will you kindly allow me to inquire, through the medium of your paper, what is supposed to have been the reason that the conductor failed to protect the building?

THOS. KNOWLES.

DAMP WALLS.

SIR,—I shall be obliged if any of your readers can tell me what many situated as I am would like to know, namely, how to keep out damp in an exposed position.

I have built a house on the borders of Dartmoor, using slate rubble for inside, and a light fireproof brick, made in the locality, for outside walls. These materials, with the aid of Aberthaw, having been put together in a very dry season, made the house a sieve, and for the first winter the house was wet through.

I next consulted some architect friends at a distance, who recommended me to give the outer walls a coating of a certain mixture of alum and soap. This was done, strictly according to orders, and the result was a second winter with the house wet through.

The following spring I had White's Portland cement put over the south and west sides of the house, to the ruination of its appearance, and, as far as I could judge, it kept the wet out, but the inner walls have nevertheless shown damp ever since (now two years), and I have had to batten.

A further portion of the house has been since coated with White's Portland cement, and has let in the wet as badly as ever.

I want to add to the house, but know of nothing suitable to build with. Battening does not keep out wet; it only hides it from sight by half an inch of plaster.

Can any of your professional or practical readers advise what, if any, solid building will effectually keep out wet? And if no solid building can be suggested, what is the best method of constructing double walls and bonding them together?

I have a dislike to paint and its periodical expense. Is there anything yet invented to supersede paint, of the consistence and waterproofness of tar, and that is made of a colour which is suitable?

I will only add that portions of the wall, painted externally with four coats, let in the wet as badly as ever after the first year.

DEVONIA.

DUSTMEN'S WAGES.

IN the St. George's, Hanover-square, Committee of Works, upon a complaint that dustmen had twice asked money for removing dust, Mr. Fearis said he had made inquiries, and found there were three men employed, who were expected to remove seven loads a day, the price being 6d. per load. This was 1s. 2d. per man per day, which, he submitted, was a price much too low. Mr. Mitchell objected to an imposition being practised on the ratepayers. If people liked to give the dustmen money voluntarily, well and good; but a demand of money was another thing. The Chairman suggested that the contractor should be written to for an explanation. Mr. Cove considered the best course was, for the vestry to be its own dust contractor, and see that the dustmen had a fair day's wages for a fair day's work. Dr. Schulhof suggested that the contractor be fined; upon which it was remarked that the price for removing the dust would be raised. The committee adopted the suggestion of the Chairman (Col. Ogilvy).

"POUR LES DAMES."

SIR,—Whether it be from a feeling of false delicacy, I know not, but the subject I will touch upon, with your permission, seems almost ignored. When our countrywomen are in France, their habits become somewhat Frenchified; and among many things to admire is the retiring accommodation there provided. What must foreigners think of our mock-modest style, where health is in many unavoidable cases sacrificed for appearance sake? Why are our large parks and promenades so destitute of accommodation, and why is the little that exists so carefully hidden from knowledge as well as sight? Why should private individuals be left to provide for so great a public want? Such provision must always be inadequate, more particularly so when payment is demanded for that which vestries ought to supply and care for gratuitously. Retiring-places, *pour les dames*, should be erected in convenient corners, and one section should be free, whether in park, or street, or railway-station. I am sorry that it has been considered necessary to close the free places at some of our principal London stations, for surely a better course than that could be adopted. Many persons there are to whom pennies mean bread, and to insist on payment by them is hard, to say the least. The sterner sex has less to complain of, but a comprehensive system might be instituted that would provide for all requirements, without being indelicately obtrusive.

LANTERN.

ASPHALTE PAVING.

THE Liverpool borough engineer (Mr. Deacon) has presented a report on this subject to the local health committee, containing information he had obtained on the subject of asphalte carriage-ways generally, together with the conclusions arrived at in relation to the probable advantages of their introduction into Liverpool, and suggestions as to the streets best adapted for a fair trial of two or more of the various asphaltes or asphaltic compositions now in use. Having referred to the experience of the use of asphalte in London and Paris, the engineer stated his opinion of its advantages and disadvantages in the following form:—

"The advantages to be derived from the use of asphalte, as compared with granite or other sets, are—First, comparative freedom from noise under heavy traffic; second, absence from dust in dry weather, and of mud in wet weather; third, cleanliness of the footways, the dirt on which is chiefly brought from the carriage-ways; fourth, increased comfort to carriage passengers; fifth, very great reduction in the wear and tear of horses and vehicles; sixth, reduction in the necessary width of openings to sewers and pipes; seventh, the facility with which repairs can be made, and their greater efficiency when made; eighth, the fact of the bed of concrete maintaining an even surface and reducing the difficulty which results from settlement after refilling openings for repairs of pipes, &c.; ninth, the small, bulk and increased value of the street refuse as manure (which should be collected as soon as it falls); the absence of necessity for watering except for cleansing purposes. The disadvantage inseparable from the use of asphalte pavement in Liverpool, as compared with the ordinary pavements, appears to be as follows:—First, the greater first cost; second, general inapplicability to gradients steeper than 1 in 60; third, the sudden change in the traction of vehicles in crossing the joints between this and any other pavement; fourth, increased difficulty of finding leaks in water or gas pipes."

Taking into consideration all the characteristics of asphalte carriage-ways, the engineer said the conclusion could not be avoided that there were disadvantages inseparable from their use which would be felt to a greater extent in Liverpool than had been the case in London and some continental cities. Many of the streets in which their benefits would be most obvious had too great a gradient to admit of their use. There could be no doubt, too, that the cost of granite or other pavement was much less in Liverpool than in those places where asphalte had been largely used, so that the relative cost of the latter would be higher. Notwithstanding such drawbacks, the advantages of this pavement

* The author would be very much pleased to see these lines practically illustrated in the interest of the public health. The readers of the *Builder* scarcely need it. No copyright reserved.

would not fail to be felt; and if, as seemed probable, several companies would undertake to lay down a portion of some street on trial at an expense to the Corporation little, if any, greater than the present cost of sets, there could be no reason why they should not do so. For the purpose of comparative experiment, such as would enable the engineer hereafter to report on the subject with greater precision, that portion of Dale-street between Hatton-garden and North John-street (comprising about 4,300 square yards) would be the best. In London the Val de Travers asphalte was estimated to cost from 1s. 6d. to 2s. 3d. per yard per annum for seventeen years, and at the end of which time it was to be left as good as new. The Montrolier Asphalte Company offered to lay down their asphalte pavement over such portion of Dale-street as might be allotted to them, and keep the same in good repair for a period of twenty years, receiving from the Liverpool Corporation the same remuneration for the work as would be paid for laying and keeping in repair that portion of the street if paved with granite sets. The Barned's Asphalte Paving Company tendered "for about 3,500 yards of asphalte paving for the carriage-road of any street in Liverpool possessing a gradient of not more than 1 in 40, the granite sets being removed, and excavations (if necessary) made to the depth of 8 in. at the expense of the Corporation." They added:—"We will, if with or without tramways, lay and furnish a concrete bed of about 6 in., and thereon lay asphalte of at least 2 in. thickness, thus furnishing the concrete, asphalte, and laying for the net price of 12s. 6d. the square yard; and we further undertake to maintain it in good order for the period of fifteen years, at the rate of 6d. per annum the square yard, reckoning over the whole surface."

The Health Committee have since come to the conclusion that it is not expedient to use asphalte far any of the roadways in Liverpool.

OLD WORK.

IN the course of a lecture "On the Decline of Gothic Architecture after the Fourteenth Century," recently delivered at a meeting of the Chester Architectural Society, Mr. A. Rimmer said:—

Much stress was laid upon the necessity of entering into Greek feelings and trains of thought before Greek architecture could be understood, and the repose of the flat surfaces of Pentelican marble among the igneous rocks of Attica. The Greek felt security in the Parthenon, which was the state treasure-house, as well as the Temple of Athena, and, raised up on a bluff that, as there was no artillery, nothing could injure. But to appreciate the ancient classic mind more fully we should go to some of the remote provinces of Rome, for of the parent city so little was left that we knew almost nothing; the only safe thing to say being that there is nothing in the present day that can give us any idea of it. The lecturer said, "Take Idumœa (Edom), a rocky fastness in the remotest parts of Arabia Petrœa, and altogether unpromising for the hand of the architect," it was approached by a long winding road of four or five miles, that has no parallel in the world: sometimes it narrowed to a space of only a few feet, and sometimes spread out into deep caverns on each side, for the road went between enormous rocks, 400 ft. and more high, being three times the height, for example, of Chester Cathedral tower. Often the daylight was obscured by projecting cliffs, and the traveller seemed to go through a long tunnel with only a gleam of light far ahead. The mystery of this was proverbial before the Romans ever saw it. "Who will lead men into the strong city?" who will bring me into Edom? The marvellous Roman remains were dwelt on, and especially a vast temple that opened out to the astonished eyes of Captains Mangles and Irby (two of the few Europeans who ever were allowed to penetrate so far). They said, after describing the wonderful approach to Edom, covered with the remains of ancient Roman pavement, and having an infinite variety of grand sculptures, wherever there is light enough to see them;—"Where the precipices are at the highest, a gleam of stronger light breaks in at the close of a dark perspective, and opens to view, half seen at first through the tall narrow opening, columns, statues, and cornices of a light and finished taste, as if fresh from the chisel, without the tints or weather stains of age, and executed in a stone of pale rose colour. Warmed at the moment we came in sight with the full light of the morning sun, the dark green of the shrubs growing in this perpetual shade, and the sombre passage from whence we were about to issue, formed a fine contrast with the glowing colours of the edifice. We know not with what to compare this scene: perhaps there is nothing in the world that resembles it. Only a portion of a vast front is seen at first, but it is so contrived that a statue with expanded wings, perhaps of Victory, just fills the centre of the aperture, which, being closed below by the sides of the rock folding over each other, gives the figure the appearance of being suspended in the air." The rest of a grand design opened at every step. This was to illustrate the eye for the picturesque that guided the architects of old; and, speaking of Gothic, he said that the old designers of England fitted their buildings to the sites they stood in so precisely, that after the solid spires of Lichfield, that of Salisbury at first struck him as being lanky and too thin, and it was only when seen from various approaches on Salisbury Plain, covering over 200 miles, that he fully understood the picturesqueness of the sharp, incisive idea of height it was meant to convey. In order to design a building now, it would be necessary to make many drawings of the surroundings from the turnpike roads, and all the neighbourhood, to see where a stack of chimneys should show, where a front or a bay window, and where it should be partly hidden by a clump of elms or a hillock. This was not necessary formerly, for the old builders designed as they went on, and had all the accessories in their eye. A singular picture of the licence allowed to them may be found in the agreement for building the Troutbeck Chapel at St. Mary's, Chester, between William Troutbeck, esq., and Thomas Bates, mason. He describes the length and breadth, and says there must be "V, faire and clenely wrought windows full of light," the best to be devised, &c. But the most touching part of the contract, and one that no mason could read at the present day without emotion, is where he speaks of the height of the chapel, which is to be carried up "as high as it needs reasonably to be." This shows how little the workmen of those days cared about "jerrying" their work. Unhappily, none of this chapel is left, and a series of splendid monuments perished with it; among these was one to Sir William and Lady Troutbeck of great beauty: the lady's head rested on a head-dress that might excite no remark in the present day, but must have been impressive in the sixteenth century. It consisted of a wreath of Trout and a Moor's head. The real cause of the decadence of English art is explained in an eloquent passage of Mr. Gladstone's, where he says that the lust for cheapness and the contempt for ornament took away the occupation of the true artists of England, and they ceased; this culminated in the time of Cromwell, where every article of beauty was thought to be idolatrous and carnal; but baldness does not satisfy, and Mr. Gladstone says, "the law of nature arrives at its revenge," "we have starved out the race that knew the laws and modes of the production of artistic beauty," and end by producing "malformations at a greater cost than would have sufficed for the nourishment among us of chaste and virgin art."

EARLS BARTON CHURCH.

THE works of restoration at this most interesting old church are now in hand, under Messrs. Slater & Carpenter. The tower is so well known as a so-called Saxon relic, that it is needless to say much about it; excepting that beyond repairing the floors, nothing will be done to it, nor will the *original Saxon plaster outside be disturbed.*

The nave and aisles are wide and lofty, and of good Decorated and Perpendicular detail. These portions will have new roofs in character, and the defective stonework restored, and will be entirely reseated.

The chancel is a very interesting portion; it is of Norman date, and was originally terminated with an apse; but in the thirteenth century it was extended and finished with a square east end, having a noble triplet window. All along the Norman walls is a blank arcade, and the Norman sedilia and piscina are refixed in the later wall; above this arcade are the inner jambs of Norman windows, with rich chevrons worked on them; but the arches and the rest of the windows have disappeared, to make way for larger Second and Third Pointed windows. The First Pointed low side windows remain, with the hooks for the wooden shutters which formerly filled them.

The general effect of the chancel is a mixture of all styles, and in the restorations it was felt that all must be left to tell their own stories of the changes which passed over the chancel; but with the roof it was different, for this was nearly flat and very modern. A new roof of oak has therefore been put on, of a high pitch, and covered with lead, and with new stone parapets and corbel table to harmonise with the thirteenth-century work. This roof has moulded tiebeams and king-posts, and is boarded to cants with rib mouldings at and between the arched ribs of the trusses. On the north side a new vestry has been built with red and white stone courses, as the ancient work in the aisles. This has a low pitched roof, so as to finish under the corbel table of the chancel.

The cleaning of the internal stonework is not yet done, nor any fitting or floors. The magnificent painted oak rood screen has been carefully preserved in its old position. Some remnants of the old wall paintings have been discovered, and will be preserved. The builder employed is Mr. Allen, of Irthlingborough, and the clerk of the works is Mr. Lucas. Stained glass is in hand by Messrs. Bell & Almond for the three eastern lancets.

SCHOOLS OF ART AND SCIENCE.

Keighley Schools of Science and Art.—The annual meeting in connexion with these schools has been held, and the prizes distributed to the successful students. There was a fair attendance, but not so numerous as the important object of the meeting justified those interested in the school to expect. The chair was occupied by Mr. John Brigg, J.P. The report, in speaking of the new building, said,—

"As is well known, the superior and extensive accommodation of this building was provided with the definite purpose of supplying, as far as possible, many educational wants which had long been felt by the people of Keighley; and in order to show the importance of the undertaking, the extent of its development, and the influence which it must exert upon this community, it is desirable that we should revert to the educational position of the Institute a little over a year ago, and in a few words describe the means that were adopted to awaken public interest in the new system."

In reference to the Science School the report said,—

"It is very pleasing to announce that, although the school has but been in operation for eleven months, there are ninety-two boys attending it. It is largely taken advantage of by the leading manufacturers and employers of labour in the district; and yet, of the whole number, fifty-one are the sons of artizans. In order to keep up the scholastic requirements of so many, there are the following masters, and another is at present being advertised for:—Head-master, Mr. J. Spencer, M.R.C.P.; teacher of chemistry, Mr. G. Ward, F.C.S.; art-master, Mr. A. Stevenson; French and German master, Mr. T. A. Cawley; assistant master, Mr. G. H. Rollason; teacher of music, Mr. J. Midgley; drilling and physical exercise, Staff-Sergeant Atty."

Of the School of Art, Mr. Stevenson (head master) reports:—

"During the year ending Midsummer, 1871, there had entered the classes 145 students; 129 of these being in the evening classes and sixteen in the morning class. . . . The works (numbering 466) produced by 100 students, were sent to the Department of Science and Art for examination on the 9th April last. The result of that examination was satisfactory, the names of twenty-eight students being returned as having executed their work in a meritorious manner, ten of them being awarded prizes by the Government Examiner for the superior excellence of their productions. It is cerain that at no former time have drawings of so high an order of merit been produced in Keighley. The excellent accommodation afforded in the new rooms, the extensive stock of examples and casts, and the valuable loans of works from the South Kensington Museum, have contributed to this result. Two free students have been appointed by the department and two by the council of the school."

In reviewing the rapid strides made in education since the new building was completed, the members of the council state that they are encouraged to continue the work which they have undertaken by the generous assistance which they have received from all classes in the town and by the hearty co-operation and assistance in carrying out their plans, of all the teachers and secretary of the institute. Especially are thanks due to Mr. Spencer, who has entered into and undertaken the work of organising and conducting the teaching of the trade school and evening classes with great enthusiasm and ability.

Mr. Mundella, M.P., addressed the meeting. He said he had heard before coming to Keighley from several impartial sources that the institution which he was going to see was almost without a parallel in England. Taking, as he did, a deep interest in mechanics' institutes, and desiring to see them the universities of the

working classes, he could not express to them the pleasure and satisfaction with which he had gone through that handsome building. He found that a town where there were little more than 20,000 inhabitants had built an institution like that, costing about 14,000*l.*, and that there were between 1,300 and 1,400 persons receiving some advantages from the institution—a great proportion very important advantages in the way of instruction. After all his experience of mechanics' institutes, that was the most spirited and most creditable undertaking he had ever witnessed. He could not help feeling, as he went from class-room to class-room and examined the models and the classes and the laboratories and all the auxiliaries of a scientific training, that although Keighley was a small town, it had got some people in it who had got long heads and large hearts. The annual exhibition of the work of the students of the art school has just taken place. The subjects shown are 113 in number, and are composed of the choice of 466 examples which were sent up to the Kensington department for examination.

The Derby School of Art.—The prizes and certificates obtained by the students of this school at the last Government examination have been distributed in the Lecture-hall, Derby. The chair was occupied by the president, Lord Belper. The Rev. A. L. Simpson read an address on "The Importance to Society of the Study and Culture of Art." The paper dwelt at length on the influence of art upon the mind and aspirations of men, and further expressed the belief of its writer that the realisation of the sublimities of art by man was the means of elevating his tone and character, and of leading him to look forward to the perfections of heavenly eternity, of which the fanciful dreams and longing aspirations excited in his mind by the study of art were but the dim foreshadowings. Mr. Jno. Rickards (hon. sec.) then read the report, which stated that—

"The Derby Central School of Art was opened on the 3rd of May, 1870; and the total number of students placed on the register for the year was 215. Of these, 24 joined the morning classes, and 19 the evening classes. Referring to a table recently issued by the department, it will be found that out of 113 Art Schools in the United Kingdom, at the last examination, only 48 obtained a place in the National Competition, and of these only 23 obtained more important prizes than Derby, so that in its first year the school has taken a distinguished position in the higher competition of the *whole* kingdom."

Mr. Simmonds, the head master, gave a brief outline of the course of instruction given in the School of Art. He condemned in strong terms the system of cheating adopted by many teachers of drawing throughout the country, who, in order to get a renewal of their lessons for the next quarter, systematically "coloured up," and in some cases even filled up the outlines of their pupils' drawings. The system, he concluded, which prevailed in his school was that recommended by Mr. Redgrave and other eminent members of the Royal Academy, and of these authorities he was but a humble, though he trusted successful, mouth-piece.

Books Received.

Strange Dwellings, being a Description of the Habitations of Animals. By the Rev. J. G. WOOD, M.A. London: Longmans, Green, & Co. 1871.

THIS abridgment, by the Rev. J. G. Wood, from his "Homes without Hands," makes a very pleasant little volume, calculated to interest, whether the reader has entomological tastes or not. We make an extract from Mr. Wood's account of wood-boring insects, which will serve to show the character of the book, while it conveys information:—

"The well-known worm-eaten appearance of furniture is caused by certain beetles belonging to another family. As may be seen from the dimensions of the tunnels, the insects are very small, and their bodies are nearly cylindrical. The ravages which these beetles cause are fatal to all who happen to possess old furniture; but Mr. Westwood mentions that one common species, *Ptilinus pectinicornis*, completely destroyed a new bedpost in the short space of three years. There is but one known method of killing the insects which have already taken possession, and of preventing others from following their example; namely, by injecting a solution of corrosive sublimate into the holes, and then treating the whole of the surface with the same poisonous liquid. I need, perhaps, scarcely mention, that insects which are popularly called death-watches belong to this family. Not only do furniture and timber suffer from the attacks of the ptilinus, but articles of dress and food are also injured by them. Specimens of natural history are often spoiled by the holes which are drilled through them by the beetles; and stationers sometimes suffer from the voracious insects, which bore holes through their wafers, fix them together, and there undergo their transformations within them. One species is obnoxious to wholesale druggists, on account of the damage which it does to the ginger. In some cases, half the ginger is drilled with holes, and rendered quite unsaleable. It is not, however, lost entirely, because it is reserved for the mill, and is then sold as ground ginger, the insects and their grubs being reduced to powder, together with the ginger which they have not consumed. Such specimens are of course not exhibited to the general gaze, as the public would be very cautious of purchasing ground ginger if they knew what it contained."

Rudimentary Magnetism. By Sir W. SNOW HARRIS, F.R.S., &c. Second Edition, revised and enlarged by HENRY M. NOAD, Ph.D., F.R.S. London: Lockwood & Co.

THIS second edition of a standard work has been posted up to the present state of the science of which it treats, by the Vice-President of the Chemical Society, who has so particularised what he has added that it can always be distinguished from the author's remarks. The volume is illustrated by 165 engravings, and forms a complete treatise on rudimentary magnetism. The editor's new matter relates chiefly to Faraday's latest researches, and to the recent important investigations by the Astronomer Royal and others respecting the deviations of the compass in iron ships. The eighth chapter is the editor's wholly, and gives a succinct account of the progress of terrestrial magnetism during the last twenty years.

Theory of Heat. By J. CLARK MAXWELL, M.A., F.R.S. London: Longmans, Green, & Co.

THE aim of this book is to exhibit the scientific connexion of the various steps by which our knowledge of the phenomena of heat has been extended. It shows that the whole science of heat is founded on Thermometry and Calorimetry, and issues in Thermodynamics. Energy and the Dissipation of Energy are pretty fully treated of; but still, although this branch of the subject is dealt with in a suggestive and interesting manner, our objection to Dr. Tyndall's definition of heat here also holds. When the author speaks of "the hypothesis that bodies consist of molecules, *the motion* of which constitutes *the heat* of those bodies," he does not give us a definitive idea of what heat as a force really is. Suppose "the motion" of a mass of molecules is towards each other, or concentrative, surely that is not *heat* in the mass, but is liker cold. And yet there is here a powerful force. Were the motion of the molecules mutually repulsive, or radiative, that would be like one's idea of heat in a mass, expanding, and even dissipating it; but this only shows that to speak of heat as being "the motion" of molecules or minute particles in a mass, is indefinite and incorrect. And, moreover, is not *motion* of any kind rather an expenditure of force than the force itself which causes the motion? Nevertheless, the volume before us is an able, and, as we have said, a suggestive one.

VARIORUM.

"A First Appearance," by Mrs. Evans Bell (*née* Magnus), is a very amusing and not uninstructive novel, recently published by Hurst & Blackett, and it has a claim on us for a sentence or two by its exposition of the loss and privation which poor weekly tenants suffer when they are obliged to leave houses condemned to be pulled down to make way for improvements. Too little consideration is usually shown for this class of tenants. If we had room, we would quote, too, a vigorous conversation on the value of the "Trattoria" system, especially as carried on in Rome, in the hope that it might lead to the establishment of some houses of the kind in London,—houses where a dinner can be ordered day by day for one person or for a family, cheap and good.

"You call at an establishment, order a dinner, say, for two persons, of six *plats*, soup, fish, *hors d'œuvres*, joint, game, and some sweet dish, besides vegetables and salad, to be sent every day. Henceforth at the appointed hour you find yourself, as if by magic, supplied with a perfect meal, beautifully brought to table, and served as hot as if brought straight from your own kitchen; for the dishes are sent ready garnished and fully prepared, on an iron tray, with a cover, round a charcoal fire placed in the middle of it, in a large tin-box:"—

and this for about 2½ francs each person. Mrs. Evans Bell has shown in her book, with a pleasant and a knowing pen, the troubles and dangers that beset a theatrical *débutante* in our many-sided metropolis. The story is dedicated to the ingenious author of "Domestic Life in Palestine," Miss Mary Eliza Rogers.

Miscellanea.

Sale of Woolwich Dockyard.—The portion of the dockyard sold is on the east side, adjacent to the centre of the town, and comprises upwards of four acres, including wharfage and warehouses, with a frontage to the river of 800 ft., approached by a new incline road about to be made in connexion with a public wharf which has been ceded to the local authorities by the Government. The property was divided into four lots, the first lot consisting of wharf property upwards of an acre and a half in extent, together with the mast-pond, a water area of 2 roods 29 perches, forming a complete dock and gates, which can be enlarged without difficulty, together with several buildings on the land, the whole having a river frontage of 303 ft. The upset price of this lot was 5,045*l.*; the lot was finally knocked down for 6,750*l.* Lot 2 comprised an area of 3 roods 33 perches, with a river frontage of 177 ft., and contains a shipbuilding slip 203 ft. in length. The upset price for this lot was 3,000*l.*, but there were no offers, and it was withdrawn. Lot 3, comprising nearly an acre and a half, with a river frontage of 220 ft., and a shipbuilding slip 258 ft. in length, was next submitted. The upset price was 3,150*l.* The lot was eventually sold for 3,950*l.*

Town Dwellings for the Working Classes of Manchester.—Mr. G. T. Robinson, F.R.I.B.A., has read a paper on "Town Dwellings for the Working Classes," before the members of the Manchester Statistical Society. Mr. Robinson said that, pre-eminent as Manchester had been for originating political and educational reforms, it was a striking anomaly that in this most urgent of social reforms it had hitherto taken no step. A great portion of the paper was devoted to the experiments made by the Metropolitan Association for Improving the Dwellings of the Working Classes, which endeavoured to secure a return for the capital invested. It also adverted to the Improved Industrial Dwellings Company, which had abandoned the open staircase system for the gallery system. To such a town as Manchester the gallery system, it remarked, was particularly applicable. What had been done by Sir Titus Salt in Saltaire, the Messrs. Crossley and Mr. Akroyd in Halifax, Mr. Hugh Mason at Ashton, and many elsewhere, was referred to. That which they, as individuals, had done from a sense of their responsibility ought, said Mr. Robinson, to be followed by collective effort in our towns. One attempt—and he sincerely hoped that it might be successful—had been made in Salford, but assistance on a much larger scale was urgently needed.

University College School Buildings.—At a recent session of the council of the College, the school committee represented the urgent necessity of an extension of the school buildings, in order to accommodate the rapidly-increasing number of pupils. Mr. Samuel Sharpe, a member of the council and of the committee, announced his intention to present the College with 4,000*l.* towards the cost of the required buildings. Mr. Sharpe had already given two sums of 1,000*l.* each to the School-Building Fund, besides 1,000*l.* to the Retired Professors Fund, and 600*l.* to the Fine-Art Building Fund. The College has recently received from Mr. J. Pemberton Heywood a second donation of 1,000*l.* to the School-Building Fund, besides 500*l.* to the Fine-Art Building Fund. At the same session, Mr. Felix Slade's executors stated that, as further aid was needed to defray the cost of the Fine-Art Buildings at the College, and to provide casts, &c., they would give 1,600*l.* for these purposes. About two years ago these executors gave 5,000*l.* towards the Building Fund.

The Crystal Palace Aquarium.—On the 12th inst. a *soirée* was given in the aquarium of the Crystal Palace, when some shareholders and their friends assembled in the tropical department to interchange congratulations on the success the undertaking has achieved since its establishment, to witness the additions made to the collection, and to listen to a lecture by Professor Flower "On the Structure and Habits of Fishes." The corridor, with its black marble tanks, containing many varieties of fish of large size, was illuminated from above. It was a study of sea-life under highly favourable circumstances.

The Registration of Trade Unions.—For the first time since the passing of the Trade Union Act (1871), 34 & 35 Vict., cap. 31, the Registrar of Friendly Societies, Mr. A. K. Stephenson, holds courts for the reception of evidence with reference to the registration of trade-unions. Mr. Secretary Bruce has just issued regulations by which the registrar is not allowed to register a trade-union under a name identical with that of any other existing trade-union known to him, whether registered or not registered, or so nearly resembling such name as to be likely to deceive the members or the public. Mr. Bruce has issued another regulation to the effect that upon an application for the registration of a trade-union which is already in operation, the registrar, if he has reason to believe that the applicants have not been duly authorised by the trade-union to make the same, may, for the purpose of ascertaining the fact, require from the applicants such evidence as may seem to him necessary. The split in the Amalgamated Society of Carpenters and Joiners, which took place last May, is the first case calling for the latter regulation to be carried into effect.

The State of the Thames at Richmond. A numerous and influential deputation from the Local Boards and vestries of Richmond, Twickenham, Isleworth, and Brentford, has waited upon the Thames Conservancy Board, at their offices, Trinity-square, Tower-hill, to urge the desirability of constructing a dock and weir at Isleworth, to improve the river between Brentford and Teddington. Strong representations were made by gentlemen connected with the district, as to the reduced and polluted state of the stream, especially at Richmond, occasioned, it was alleged, by the action of the Thames Embankment, the dredgings below bridge, and absorptions by the water companies. Mr. J. Thorp, deputy-chairman of the Board, said he conceived that the object desired was a high or low water level. That had been discussed at the Board over and over again, but it was difficult to find the means of accomplishing it without injury to the navigation. It was the duty of the Board to do their best for the whole river, not a part, and he could only say now that the subject should be further considered.

Geometrical Teaching.—The annual meeting of the Association for the Improvement of Geometrical Teaching has been held at the University College, Gower-street. The president, Prof. Hirst, F.R.S., referred chiefly to the superiority of the method of teaching geometry pursued in Italy over that practised in England. The object of the association, he said, was to bring up the level of geometrical teaching to the science of our day, and to endeavour to discover what unanimity there is among teachers by inviting contributions to the forming of a programme of a greatly improved method of teaching. He remarked that a perfect text-book was required, but such a book must be the work of a master-mind that had devoted itself for years to the subject. All teachers should aim chiefly at their own advancement; for only from a highly-cultivated instructor could proceed efficient teaching.

The Baroness Burdett-Coutts's Memorial. A public meeting has been held in the Hall of Columbia Market, in order that the proposed memorial to the Baroness Burdett-Coutts might be considered, and that the working men of Belthnal-green and Spitalfields might give expression to their wishes on the subject. The chair was taken by Alderman Sir Thomas Dakin. There was a good attendance, chiefly of working men. It was unanimously resolved, "That this meeting pledges itself generally to support the movement, and to confirm what the committee has done;" "That a committee be formed to collect subscriptions;" and "That an acceptable memorial be presented to the Baroness-Burdett Coutts." It is to be hoped that only those who can afford it will be asked to subscribe.

Benhar Coal Company.—This Company has been formed for working the well-known valuable Benhar Coal-field, comprising more than 2,000 acres, held in lease by Mr. George Simpson, coalmaster, Benhar, Lanarkshire and Linlithgowshire, with the pits and mineral plant connected therewith. The mineral field is nearly equidistant between Edinburgh and Glasgow, and is intersected by branches of the North British and of the Caledonian Railways. The field is said to present the advantages of a superior coal at very moderate depth, little water in the workings, and easy access to many markets.

The Labour Question in the United States.—We read in the *New York Times*, of December 21:—"The House of Representatives yesterday passed the Bill introduced by Mr. Hoar, of Massachusetts, to provide for an investigation of what may be broadly called the labour question in the United States. Mr. Hoar proposes a commission of three members, to be appointed by the President, with the consent of the Senate, to hold office for one year, unless their labours are sooner completed. The Commissioners are authorised to employ a clerk, and are to receive a salary of 5,000 dollars each. The subjects to which they are to direct their inquiries are, the wages and hours of labour of the labouring classes; the division of the joint profits of labour and capital between labourers and capitalists; and the effect of existing laws regulating commerce, finance, and currency on the social, educational, and sanitary condition of the labourers."

New Lunatic Asylum for Kent.—The magistrates of the county of Kent have just determined to erect a new lunatic asylum, capable of accommodating 1,000 inmates. The county already possesses an asylum at Barming-heath, and there are upwards of 1,250 patients located there; but lunacy has so rapidly increased during the last ten years, and the operation of the Metropolitan Poor Act, 1867, having thrown large numbers of lunatics hitherto maintained in workhouses upon the county rates, the justices, to whom the matter had been referred, reported that there was no alternative but to build a new asylum. It has been decided to erect the new establishment in East Kent; and it is computed that the outlay will be from 150,000*l.* to 200,000*l.*

The Proposed new Surrey Chapel.—Some stir was produced at Surrey Chapel on Sunday morning, in consequence of an announcement by the Rev. Newman Hall, that the offer of a portion of the ground on which the Female Orphan Asylum, Westminster Bridge-road, stands, had been accepted for the sum of 8,000*l.*, so as to erect the new chapel thereon. Cards had been left in the pews, and by the evening 2,500*l.* had been collected. Mr. Samuel Morley, M.P., had given 500*l.* There is also a reserve fund of 12,000*l.*, which has been in the course of collection for many years. The new chapel will be commenced as early as possible, and is to have a lofty tower. According to the *Parochial Critic*, Mr. Ruskin is to be the architect.

Chester Workhouse.—The local guardians have resolved upon the purchase of a site for their new workhouse. Sixteen acres are to be taken, the place selected being in Hoole-lane, and the price 3,500*l.* The locality, says the local *Chronicle*, is not an undesirable one, and the price is not high. Some little doubt had been expressed about the drainage; but members of the board present stated that there was a good fall, and that no danger need be apprehended on that score. The site was the unanimous choice of the guardians; and, considering the long delay which occurred in the erection of the Town-hall from a division of counsels upon this point, that must be regarded as a fortunate and satisfactory circumstance.

Value of Property in London.—At the Auction Mart last week, Messrs. Fox & Bousfield, submitted to competition the freehold premises, No. 53, St. Mary-axe, containing an area of 2,000 superficial feet, in the occupation of the Board of Guardians of the City of London Union, under a lease granted some twenty years ago, and at a rent of 120*l.* a year. A keen competition ensued, which resulted in the sale of the property for 7,700*l.*, being at the rate of nearly 4*l.* per foot, equal to sixty-four years' purchase on the old rental. According to the *City Press*, a piece of land adjoining the Lombard Exchange, in Lombard-street, has been sold for 9,000*l.*, or about 19*l.* 4s. 6d. per foot super.

A Gasometer Destroyed.—One of the large gasometers at the Northampton Gasworks has been totally destroyed by wind, and upwards of 2,000*l.* worth of damage done. The wind was blowing a terrific gale, and caught the gas-holder, and caused it to tilt on one side, when the cast-iron columns, which are 2 ft. 6 in. in diameter, broke off, and one of the falling columns fell upon the top of the holder and made a large hole, through which the gas escaped, and the holder as soon as empty fell into the tank one mass of fragments.

New Docks at Milford Haven.—A movement has been started for the purpose of constructing docks at Milford, of such a size as will provide accommodation at neaptides for a class of vessels similar to the Spain and other new steamers belonging to the National Steamship Company. It is stated that vessels of this class could make to New York two more passages per annum from Milford than from Liverpool. The necessary Parliamentary powers by which the construction of the works may be proceeded with are in existence. The cost, as estimated by Mr. Hamilton Fulton, the engineer, is 600,000*l.*

Trade Halls and Social Clubs.—An interesting paper on the subject of "Trade Halls and Social Clubs for the Operative Classes" was read by the Rev. Mr. Solly, on Thursday in last week, at the National Congress of Trade Societies, at Nottingham. An opinion was expressed by the writer that the great obstacle to the establishment of such associations was the want of mutual confidence among working men. A resolution was adopted approving of the scheme propounded in the paper, as tending to promote social reform, and recommending its adoption.

A Town Sinking.—The Northwich Local Board have had a discussion as to the sinking of the town and the salt-producing districts around. The trustees are about to deepen the River Weaver to Winsford Bridge, and it is said that if they do not get an invert or a plank piling of the river round the town, the whole town would fall, or there would be an immediate subsidence, and eventually a collapse of the greater portion of the property of the town. The sinking in many places is caused by the river running through the quicksand into the old rock shafts.

The Sanitary State of Scarborough.—In consequence of the notoriety obtained by Scarborough through the remarks of the medical press with respect to the illness of the Prince of Wales, the Local Board have resolved to inquire into the sanitary condition of the borough, and have addressed a circular with schedule of questions to each householder. Information thus obtained will be used collectively, with a view to sanitary improvement; but particulars relating to houses individually will be kept in confidence. It is quite time something was done.

Hampstead Heath.—On Saturday, 13th the Metropolitan Board of Works took formal possession of Hampstead-heath, and dedicated it to the public. By the arrangement effected, the great bulk of the heath—that is to say, land consisting of the upper and lower heath proper, to the extent of, it is said, some 225 acres, is secured to the public for ever, at a cost of 45,000*l.* It is already being asserted that some of the most picturesque spots have been omitted in the purchase, and complaints are made.

Chester Walls.—The local *Chronicle* says,—"The foundations of some cottages are being laid at a spot which may be emphatically described as one of the very best sites in Chester. Outside the Castle walls, near the Grosvenor Bridge, and at a point singularly conspicuous, it has been considered a proper thing by the War Office to plant these small houses. They are intended for married soldiers." A pressing representation is to be made on behalf of the Town Council to the War Office against this senseless performance.

Church Struck by Lightning.—During a recent fearful storm of hailstones and thunder, which raged over the estuary of Loughor, the church at Penclawdd was struck by lightning, and much damage was done to the fabric. About 3 ft. of the point of the spire was knocked off, and a large hole was made through it lower down, close to the roof. Two windows at the west end were reduced to fragments, and a great part of the roof was either carried off or knocked in.

Opening a Public Hall in Sunderland. A large public hall, erected mainly by the friends of temperance, has been formally opened by the Mayor of Sunderland. The hall supplies a want which has long been felt in the town, namely, that of possessing a commodious building for political and other purposes. The hall is capable of holding 3,000 persons comfortably, and has been erected from designs by Mr. G. Gordon Hoskins, of Darlington, at a total cost of 9,500*l.*

Proposed Railway and other Works affecting the Holborn District. — The Surveyor to the Holborn Board, Mr. Lewis H. Isaacs, has reported on "the plans that have been deposited seeking for Parliamentary powers for railway and other works affecting the district." The report is published, and will be found interesting to those concerned. The value to the Holborn district of the proposed new thoroughfare from Vernon-place to Old-street is strongly dwelt on.

The Building Sites adjoining Finsbury and Southwark Parks.—At the last meeting of the Metropolitan Board of Works, on the motion of Mr. Newton, seconded by Mr. Savage, it was resolved :—

"That the officers of the Board be instructed to take no further steps for the present towards letting land for building purposes in Finsbury and Southwark parks; and that it be referred to the Parks, Commons, and Open Spaces Committee to inquire and report on the best means of utilising the land in question for the public benefit."

An Artesian Well.—An artesian well has been sunk in the courtyard of the naval hospital at Rochefort to a depth of 846 mètres (2,774 ft.). M. Roux, pharmacien to the hospital, reports that the temperature is 51 deg. cent. (about 105 Fahr.) Contrary to what is generally observed in artesian wells, the water contains a large quantity of saline matter, and is quite unfit for drinking or washing.

Club-houses for Working Men, Dundee.—Mr. Armistead, one of the members for Dundee, has presented 5,000*l.* to be expended in providing two club-houses for the working men. Several gentlemen are to be appointed trustees, but it is intended to leave the working men who become members to make the arrangements of the institutions themselves.

Bruton, Somersetshire. — The Sanitary Committee of this town have engaged Messrs. Gotto & Beesley, and Mr. A. W. Estridge, to prepare plans and estimates for the drainage of the town, and to report as to the best means of disposing of the sewage so as to prevent the pollution of the river.

The State of Yeovil. — The spasmodic endeavours now being made to remove some of the evil conditions that afflict Yeovil form a striking commentary on the reception given to our statements concerning the place made not long ago. An apology to us would not be out of place.

Royal Sanitary Commission.—On Monday evening, the 22nd inst., Mr. G. W. Hastings will open a discussion on the Report of the Royal Sanitary Commission, at a meeting of the Social Science Association, at their rooms in Adam-street, Adelphi, at eight o'clock.

The Wandsworth Mortuary.—At their last meeting, held this week, the Wandsworth Board of Works decided that the plans submitted for the proposed mortuary be approved, and that tenders be invited for the building from five local builders.

The Kew Instructional Institute.—The Kew Instructional Institute has been opened by his Royal Highness the Duke of Cambridge, in the presence of the principal inhabitants of the village.

The Floating Dock for Bermuda.—There appears to have been considerable bungling in placing this remarkable work in position. Considering that it cost a million of money, it has not hitherto received very careful treatment.

Park-lane Sewer.—Some abuse is being bandied about in connexion with the recent sewer works in Park-lane. Fresh inquiries are, rightly, to be made by the Vestry of St. George's, Hanover-square.

Drawing in Oxford.—Mr. Ruskin's to offer 5,000*l.*, for the purpose of an endowment pay of a master of drawing in the Taylor Galleries, has, with some modifications approved by Mr. Ruskin, been accepted by the University of Oxford.

Halesworth Sewerage Competition.—The Sanitary Board has adopted the scheme proposed by Mr. Bennett Fitch, C.E. There were seven plans sent in.

Edinburgh.—Arrangements are in progress for providing a new cemetery for Edinburgh.

TENDERS

For new granary, Prince's-wharf, Prince's-stairs, Rotherhithe, for Messrs. T. & W. Easton. Mr. George Loe, architect :—

Woodward	£5,650 0 0
Gammon & Son	5,213 0 0
Hill, Keddell, & Waldram	4,975 0 0
Crockett	4,950 0 0
Morter	4,910 0 0
Henshaw	4,890 0 0
Tarrant	4,797 0 0
Hart	4,786 0 0
Marriage	3,450 0 0

For excavator's, mason's, bricklayer's, carpenter's, and founder's work, of Upsall Castle, near Thirsk, for Captain E. Turton. Messrs. Goldie & Child, architects :—

Hopkinson	£10,306 0 0
Illingworth & Sons	9,367 0 0
Bulmer	9,365 0 0
L. H. & R. Roberts	8,847 0 0
Robson & Son	8,695 0 0
Keswick	8,670 0 0
Burmby	7,915 0 0
Bellerby	7,315 0 0
Shaftoe & Barry	7,100 0 0
Weatherby & Rymer (accepted)	6,250 0 0

For the erection of a house, &c., for a gentleman, in Kent. Messrs. John Tarring & Son, architects :—

	General Estimate for House, Stables, Lodge, &c.	Principal Staircase in Wainscot instead of Deal, additional.	For using Fareham instead of Red Suffolks, additional.
Kimberley	£5,906 0	£34 0	—
Dove, Brothers	5,375 0	40 0	£55 0
Myers & Sons	5,339 0	50 0	66 0
Hill & Sons	5,294 0	29 10	120 0
Macey	5,258 0	54 0	50 0
Henshaw & Co.	5,017 0	50 0	—
Kilby	4,999 0	50 0	—
Manley & Rogers	4,803 0	65 0	—
Perry & Co.	4,769 0	40 0	56 0

For the first portion of Messrs. Threlfall's new brewery, Liverpool. Mr. G. Scamell, architect. Quantities by Messrs. Curtis & Son :—

		Allowed for Old Materials.
Kirkham	£6,000	—
Tomkinson & Son	6,075	£250
Haigh & Co.	5,799	250
Burrough & Son	5,640	—
Jones & Co.	5,428	—
Urmson	5,671	250
Holmes & Nichol*	5,348	—
Ironwork.		
T. H. Head & Co. (accepted)	£1,076 0 0	

* Accepted.

For the erection of Blewbury Vicarage. Mr. Edwin Dolby, architect :—

		Deduct for Old House.
Johnson	£1,949 0	£20 0
Williams	1,750 0	25 0
Wheeler & Gregory	1,726 2	15 0
Kimberley	1,640 0	—
J. & T. Davis	1,630 0	—
G. Jones	1,620 0	40 0
T. Jones	1,620 0	50 0
Castle & Co.	1,565 0	40 0
Selby	1,558 0	70 0
Gibson, Brothers	1,537 10	70 0
Honour & Castle	1,428 0	45 0

TO CORRESPONDENTS.

T. W.—A. F.—H. A. P.—W. S.—W. S.—G. M.—B. F.—W. T. T.—Mr. E.—H. D.—Dr. H.—L. S.—J. P.—H. T.—T. & C.—G. & B.—A. H.—A. D. D.—G. D.—Dr. W.—W. C. A.—T. P.—R. G.—P. & Sons.—R. T.—W. S.—C. B. A.—M. U.—J. C. C.—J. A.—R. S.—W. G., sen.—T. A.—H. J. L.—X. X. X. (there is no royal road to the knowledge in question: it must be gained by observation and experience).—P. L. S. (properly used, concrete may be safely adopted).—H. W. R. (suggestions have often been made in our pages).—L. J. (we have already mentioned where subscriptions for Mrs. Randall may be sent).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

Bath and other Building Stones of Best Quality.—RANDELL, SAUNDERS, & CO. Limited, Quarrymen and Stone Merchants. List of Prices at the Quarries and Depôts, also Cost of Transit to any part of the United Kingdom furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

Ashton & Green, Slate and Slab Merchants and Quarry Agents.—Shippers, Merchants, and Contractors furnished with Price-lists of every description of ROOFING and MANUFACTURED SLATE, Railway-rates, &c. Agents for London and Country for the Sale of the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices of A. & G.'s RED RIDGE TILES, specially prepared for use with these Slates, on application.—Offices and Show-rooms, 14 and 15, Bury-street, St. Mary Axe, London, E.C.—[ADVT.]

Turret Clocks.—Mr. Streeter, 37, Conduit-street, London, W., Manufacturer of Turret Clocks (with gravity or dead-beat escapement) for Churches and Public Buildings. Estimates and plans on application. Price :—Village clocks, from 15*l.*; church clocks, from 40*l.* The wheel-work throughout these clocks is of best hard brass or gun-metal. No iron wheels used. Timekeeping and durability guaranteed. Wholesale Entrance—Burlington Steam Works.[ADVT.]

"**Like all grand conceptions,** the process is remarkable for its simplicity." This was said by the *Globe* of the method by which *The Bazaar, the Exchange and Mart,* and *Journal of the Household* enables ladies and gentlemen to sell, exchange, or buy every description of property with ease, security, and without making their names public. Specimen copy, containing full directions, post free, two penny stamps.—Office, 32, Wellington-street, Strand, London.—[ADVT.]

PERFECTION in BOOKKEEPING. — Builders and Others desiring a really good system, can have a SET of MODELS for BUILDER'S BOOKS, by DOUBLE ENTRY, to which was awarded the prize offered in "The Builder," No. 1,180, and which has been adopted by many large firms. Also a Modified Arrangement by Single Entry, suitable for small builders.—Address, E. A. 4, St. George's-road, Regent's Park, London.

THE NEW COURTS of JUSTICE.—NOTES in REPLY to CRITICISMS. By GEORGE EDMUND STREET, R.A.
RIVINGTON'S, Waterloo-place.

Now ready, demy 8vo. price 12s. 6d. cloth, with 14 folding plates, and numerous woodcuts. Postage, 6d.
LAND and MARINE SURVEYING; in Reference to the Preparation of Plans for Roads and Railways, Canals, Rivers, Towns Water Supplies, Docks, and Harbours. With Description and Use of Surveying Instruments.
By W. DAVIS HASKOLL, C.E.
"A carefully-written and valuable text-book."—*Builder.*
London: LOCKWOOD & CO. 7, Stationers' Hall-court, E.C.

Now ready, with 46 plates, imp. folio, price 2*l.* 2s. (postage 1s. 4d.)
EXAMPLES of BRIDGE and VIADUCT CONSTRUCTION, of MASONRY, TIMBER, and IRON; from the Contract Drawings or Admeasurements of Select Works.
By W. DAVIS HASKOLL, Civil Engineer.
"One of the very few works extant descending to the level of ordinary routine, and treating on the common every-day practice of the railway engineer."—*Engineering.*
London: LOCKWOOD & CO. 7, Stationers' Hall-court, E.C.

Now ready, woodcuts, 12mo. cloth, price 3s. 6d. (postage 3d.)
THE ARCHITECT'S GUIDE; or, Office and Pocket Companion for Engineers, Architects, Land and Building Surveyors, Contractors, Builders, Clerks of Works, &c.
By W. D. HASKOLL, C.E.; R. W. BILLINGS, Architect; and Others.
London: LOCKWOOD & CO. 7, Stationers' Hall-court, E.C.

Now ready, with 13 large folding Plates, imperial 8vo. 12s. cloth (postage, 5d.)
A PRACTICAL and THEORETICAL ESSAY on OBLIQUE BRIDGES.
By G. W. BUCK, M.Inst.C.E.
Second Edition. Corrected by W. H. BARLOW, M.Inst.C.E.
"A very complete treatise."—*Builder.*
"The standard text-book."—*Engineer.*
London: LOCKWOOD & CO. 7, Stationers' Hall-court, E.C.

On the 1st of FEBRUARY.
JACK OF ALL TRADES.
Edited by Professor PEPPER.
Price Three-halfpence; post free, Two-pence.
CLAYTON & CO. (Printers), Bouverie-street, Fleet-street.

Now ready for subscribers, price 4s.; free by post, 4s. 4d.
THE ILLUSTRATED PRICE-BOOK for 1872, for the Use of Architects, Engineers, Surveyors, Builders, &c. With Five Plates, containing Plans, Elevations, and Views of Mansions, Villas, and Cottages, with specification.
The prices and tables have been most carefully arranged and revised in order to make the work as complete as possible, and useful alike to the professional man and tradesman.
London: Published by R. A. SPRIGG (late ATCHLEY & CO.), No. 196, Great Russell-street, Bedford-square.

W. H. BARBER, Surveyor, 12, Buckingham-street, Strand, W.C. twenty years with Messrs. Myers and Messrs. Mansfield, has REMOVED his OFFICES to the above address. Quantities and Estimates prepared, and every kind of assistance rendered on moderate and mutual terms. DISPUTED AND INTRICATE ACCOUNTS ESPECIALLY ATTENDED TO.

T. A. RICHARDSON, ARCHITECTURAL ARTIST, Lincoln's-inn-fields Chambers, Lincoln's-inn, W.C. Artistic Perspectives in outline or colour, competition working and detail drawings, designs from sketches or instructions. Highest references. Moderate terms. Established nineteen years.

SURVEYING.—Surveying and Levelling, with Maps and Plans of Estates, Designing and Superintending the Construction of Buildings, by D. HAYLOCK & SON, 12, Meyrick-villas, Meyrick-road, Clapham Junction. Land Surveying and Levelling Taught.

PUPIL.—WANTED, an Additional Six Months' PUPIL on Large Survey, with Planning and Levelling, in Yorkshire. Age, 18 to 21.—Address, D 87, "Observer" Office, Bradford, Yorkshire.

PRESTON SCHOOL of ART.—WANTED, a MASTER, qualified under the Art and Science Department, to enter upon his duties immediately after the Midsummer vacation. Net emoluments from fees and grants have been about 130*l.* per annum, whilst the locality offers a favourable field for an efficient master increasing their amount.—Testimonials and applications to be addressed to W. NEWSHAM, Hon. Sec. School of Art, Avenham, Preston, and forwarded to him on or before FEBRUARY 10th, 1872.

ARCHITECT'S ASSISTANT WANTED. WANTED, in the Office of an Architect and Surveyor, a good and well-qualified DRAUGHTSMAN. One with experience in Classic work preferred. Salary, two guineas per week.—Apply by letter, stating age, experience, &c. to A. J. S. Post-office, Swindon, Wilts.

WRITING and GRAINING.—A Young Man wishes to LEARN the above. Is willing to serve three years. Has had six years' experience in painting and glazing.—Address, 651, Office of "The Builder."